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RECIPROCITY WITH BRAZIL.

Of the utmost importance to the exporters of the United States was the proclamation of the President, on the 5th inst., announcing the arrangement of a convention between this country and Brazil, whereby reciprocity in many branches of trade becomes established between the two countries. The treaty makes a valuable series of concessions to the commerce of the United States, and the interests of Brazil are generously provided for. In return for the exemption of duty, in this country, on sugar, molasses, coffee, and hides, the government of Brazil has authorized the admission, free of duty, of a wide range of articles, the product and manufacture of the United States. The schedule includes a large number of agricultural products, all the grains and manufactures of them, pork (except hams), cotton-seed oil, coal, naval stores, agricultural, mining, and mechanical tools and machinery, steam engines, scientific instruments and books, materials for railway equipment and construction, and all kinds of industrial machinery, except sewing machines.

In addition to this, the government of Brazil has agreed to make a reduction of 25 per cent. upon dairy products, canned goods, and the manufactures of cotton, iron and steel not included in the free schedule, leather and its manufactures, except boots and shoes, furniture, wagons and carriages, and the manufactures of rubber. These provisions go into effect upon April 1st, 1891.

This treaty may justly be considered the most important step taken in behalf of the commercial development of this country for many years. It opens to the farmers and manufacturers of this country one of the largest and most promising markets in South America. The scope of the treaty is so broad that its benefits cannot fail to be felt throughout the United States, and a great expansion of our foreign trade should speedily follow.

In this connection, it is interesting to note that there is some probability also of the negotiation of a reciprocity treaty with Cuba, the Spanish Government, according to advices from Madrid, under the date of 26th ult., having accepted the proposals of the United States, tending to that end. Cuba, so far as that dependency can act, is eagerly seeking such a treaty, which, of course, is important to it in order to insure a free market for its sugar, while the United States would derive results from such, of similar importance to those which will come from the Brazilian treaty.

METALLIC RAILWAY TIES.

In previous volumes of the ENGINEERING AND MINING JOURNAL we have many times called attention to the advisability of the adoption of metallic ties by the railroad companies of this country. In doing this, we have pointed out that such a step was becoming a necessity, even, by the alarming rapidity with which our forests were being denuded. Not only this, but that the use of such ties would be to the interests of the railway companies themselves as instituting a great economy in the expense of maintenance of way, which is always a heavy charge in the cost of operation; and, finally, that from the improved road-bed, which would be the result, with an almost entire elimination of the danger of spreading rails, the safety of the traveling public would be, in a great degree, increased.

Metallic railway ties are by no means a new invention, although the railway companies of the United States have been singularly backward in adopting them. They were laid upon European roads as early as 1860, and since that time the number has increased so that, in 1890, no less than 10,222 miles of track were laid with them. In addition to this, there were, in the same year, 1,291 miles in Africa; 9,314 in Asia, chiefly in India, and 3,788 in Mexico, Central and South America; but in the United States, a nation usually in the lead of all improvements, there were only two miles, these having been put down as an experiment. It is the cheapness of wood, undoubtedly, which has retarded the development of this system in this country, but with the increasing scarcity of timber and the fact, which has been demonstrated that, although the first cost of a mile of road laid with metal is greater than when laid with wood, its cost of maintenance is very much less, the use of the former is likely to increase with the rapidity with which steel rails displaced iron. Quite aside from the question of cost, it would seem that that of safety, alone, were of sufficient importance to justify the substitution of a substantial metallic tie for the short-lived wooden one with its unreliable fastening.

In our issue of December 29th, 1888, we described the various kinds of metallic ties in use in foreign countries, and those that had been tried in the United States, among others that of the Standard Metal Tie and Construction Company, and, as bearing out our statements then made, a report concerning them, recently made by JOHN W. CLARKE, general roadmaster of the Chicago & Western Indiana Railroad Company, is of interest and value.

Three-fourths of a mile of track were laid with these ties in October, 1889, and the time elapsed has been sufficient to give results of some reliability. The ties were laid at a point where the ballast was light gravel, and the traffic, 80 regular trains in one direction each day, the heaviest engine weighing 96,000 pounds, with 15,000 pounds on each pair of drivers. During the 15 months that the ties have been down, 37,500 trains have passed over them, and Mr. CLARKE states that the cost of maintenance has been so small as to be hardly worth taking into consideration.

The ends of the rails, where those laid upon wooden ties become slightly flattened, had remained perfectly smooth and even, indicating the absence of the wheel blow at the joint, injurious to rail and rolling stock alike. Riding over the section had been as if it were laid with continuous rails. The rails had stood perfectly upright, and had worn evenly upon the top. The freezing and thawing of two winters had had no effect upon the track, which had remained in perfect line and surface. The fastenings had remained good and the track was as firmly held as when first laid.

These results are essentially in accordance with those which have been obtained in foreign countries where metallic ties have now been in use long enough to give most reliable evidence of their value.

In a recent bulletin of the Department of Agriculture, startling figures are given concerning the annual consumption of timber in this country. There were, according to the returns received, 516,000,000 ties, or an average of 2,694 per mile of railroad, in use in this country in 1889; 310 ties per mile, or a total of 60,000,000, were annually required for renewals and 13,000,000 for new construction. Mr. B. E. FERNOW, Chief of the

Forestry Division, states, however, that the annual amount required for renewals was undoubtedly nearer 80,000,000. Including bridges, the annual consumption of timber is 500,000,000 cubic feet, requiring cutting from 100,000 acres of forest, and quite 60 per cent. of the ties used are of oak, our most valuable timber. To meet this demand it would be necessary to preserve 50,000,000 acres, or more than 10 per cent. of our present forest area.

With the interest that is now being taken in the attempts to preserve the Adiroudack forest, and the timber growth at the sources of the great rivers in the West, a plan which will remove the necessity for their denudation is of importance. The replacement of timber by iron, both in mines and on railways, to a great extent, is certainly only a question of time. Its advantages are great in both cases.

HIRSH'S ALUMINUM PROCESS.

The daily press have now apparently arrived at the same opinion concerning the aluminum process of Professor HIRSH, of Chicago, which the ENGINEERING AND MINING JOURNAL expressed as long ago as last August, and are now as busily engaged in exposing it as they have hitherto been in gratuitously advertising it. The Chicago *Daily News* of the 14th ult. has a two-column article on the subject, which gives some interesting historical details. From it we learn that a year ago Mr. HIRSH announced to his friends that he had a process for producing aluminum at a wonderfully cheap price, and induced Mr. HEDENBURG, a Chicago real estate dealer, to advance $500 for the purpose of providing for experiments. A few days afterward Mr. HEDENBURG was shown some samples of aluminum as an evidence of good faith, but he declined to advance any more money, as Mr. HIRSH would not furnish satisfactory security that the money would be properly used. Afterward Mr. F. L. BABCOCK, an insurance man, became interested, a company with $1,000,000 capital stock was organized, and $5,000 was advanced to Mr. HIRSH. With this money HIRSH rented a five-story brick building at West 12th and Rockwell streets, Chicago. This was in August last, and immediately afterward the project was boomed in the daily papers and telegraphed all over the country, while the ENGINEERING AND MINING JOURNAL at the same time informed its readers of the suspicious character of the enterprise.

About the time the factory was rented, Mr. BABCOCK sold his stock to W. L. MARSTON and F. B. MODICA, who thus practically secured control of the company. We have a pleasant recollection of a call of Mr. MARSTON at this office in September last, and of his expressing his regrets that the JOURNAL had denounced Professor HIRSH'S process, but the representations he made to us concerning it were not such as to cause us to retract our statements. After the renting of the factory but little work in actually producing aluminum appears to have been done, and the *Daily News* says that one lonesome dynamo still stands in the back room of the big building, and the discovery which promised so much has not yet affected the market price of aluminum.

Mr. MARSTON and Mr. MODICA became impatient when week after week passed without the infant industry showing signs of life, and about a month ago they asked the professor to go to Washington, demonstrate his process, and take out a patent. He refused to do this, saying that if he published his secret it would be appropriated by others, and he would lose the benefit of it.

Two weeks ago, continues the *Daily News*, Mr. HIRSH went to New York with Mr. MARSTON, the object being to sell stock in the Chicago Aluminum Manufacturing Company. The gentlemen found the New York capitalists ready to invest if it could be shown that the company possessed a *bona-fide* cheap process. Mr. MARSTON suggested to his partner that a trip be made to Washington to lay the satisfactory proofs before the Patent Office. Mr. HIRSH was still obdurate, and Mr. MARSTON returned to Chicago alone.

Upon Mr. MARSTON'S arrival in Chicago, he was surprised to learn that during his absence the Hirsh Aluminum Plating Company, with a capital of $2,000,000, had been incorporated, the new company claiming that HIRSH had not given to the old one the right to plate with aluminum, but merely to manufacture the metal in bulk. Mr. MARSTON of course disagreed with this view, holding that the processes of plating and of manufacture were the same, and therefore that HIRSH could not hand over the plating industry to any new company. Mr. HEDENBURG also complains, and has brought suit for the fulfillment of the agreement made last winter. Mr. HIRSH meantime remained in New York and viewed the battle from afar.

Neither Mr. HIRSH nor Mr. MARSTON honored the ENGINEERING AND MINING JOURNAL with a call during their stay in New York, notwithstanding our courteous treatment of Mr. MARSTON when he called last summer and objected to our exposé, but we have heard from several different sources of Mr. HIRSH'S doings while in the city. He called upon a well known chemical expert and showed him an ordinary faucet said to be plated with aluminum, and asked to have the plating tested. The test proved, sure enough, that the plating was of aluminum. Showing the sample, he tried to interest capitalists in the new aluminum plating industry, assuring them that this well known chemist fully indorsed what he (HIRSH) represented. Some of these capitalists called upon the chemist for his opinion on the process. He took the same stand that the ENGINEERING AND MINING JOURNAL did last summer, and said that while the plating was certainly aluminum, he had no confidence in Mr. HIRSH, and could say nothing whatever of the "Hirsh Process," and would not recommend any one to invest money with him.

HIRSH called also on the International Aluminum Works, which has an office at 36 John street, New York, and which claims to furnish solutions for plating in aluminum bronze and aluminum tin, and also to have done some plating with pure aluminum. They say they gave Mr. HIRSH some samples of their plating, and that it is likely he also obtained some from another concern which does aluminum plating in Ravenswood, Long Island.

The mere fact that Mr. HIRSH showed samples of aluminum-plated ware does not, of course, prove that he has a process for plating. The International Aluminum Works do not claim, however, to manufacture aluminum by depositing it from an aqueous solution, as in electroplating, as HIRSH claims to do, but on the contrary they use a solution made from the metal itself, which they purchase from the Pittsburg Reduction Company. They state that they had quite an experience with HIRSH; that he came repeatedly with the apparent object of getting information concerning their methods. In a letter dated January 15th they say: "We have now in our possession a letter written by HIRSH to a person wherein he shows that he was in need of a process for the electro deposition of aluminum, at the very time he (HIRSH) has been claiming that he was manufacturing aluminum by an electrical method. The letter (of date of September 6th, 1890) came into our hands through inquiries we were instituting into the above person's claims. We gave HIRSH a sound piece of our mind and ordered him out of our office, as he was taking up our time in his numerous calls, and trying his best to get some information for nothing that would assist him in his schemes"

The proprietor of a small steam dye house recently purchased from the Pittsburg Reduction Company three lots of aluminum wire, six lots of rolled sheets of various thicknesses, and some 35-pound ingots, the whole weighing 182 pounds and costing about $450. The *Daily News* reporter could not find any information about this aluminum at the dye house, but found similar ingots and wire at the office of the Chicago Aluminum Manufacturing Company, where Mr. MODICA explained to him that they were made by Professor HIRSH. He claimed that HIRSH had made 200 to 300 pounds up to the present time. We are told that HIRSH, when in New York, claimed to have made 2,600 pounds.

Mr. MARSTON, according to the *News*, said: "We have advanced $15,000 already, and now HIRSH wants us to put up $100,000 before he demonstrates his success. Of course we are satisfied he can manufacture the metal because we have visited the works and seen the stuff he turned out, but we insist that he should put us into possession of the process. We have notified him to observe the contract which he gave us and which is binding. No other company can claim any part of the HIRSH discovery, because it is our property."

Mr. BABCOCK, secretary of the Hirsh Aluminum Plating Company, on the other hand, says: "We claim the right to use the plating process, because the other company was organized to manufacture the metal. I am satisfied that Professor HIRSH can deposit the metal by an electrical process, because he has shown me iron and copper articles plated with aluminum. The plating was not very thick, it is true, but he says he can make it as thick as he wants it."

The innocence of Messrs. MARSTON and BABCOCK in believing, the one that HIRSH had produced aluminum, because he "visited the works and saw the stuff," and the other that HIRSH had made aluminum-plated ware, because "he has shown me iron and copper articles plated with aluminum," reminds us of the people who were taken in by the electric sugar-refining process in this city about two years ago. They believed in the process, because they had visited the factory and had tasted the sugar.

The capitalists to whom HIRSH applied while in New York, declined to invest in his process, because he would not submit it to an expert investigation, but this no doubt will not discourage HIRSH from attempting to raise capital elsewhere. If he can start a $1,000,000 aluminum company and a $2,000,000 plating company, and raise over $15,000 in cash all in one year, he will no doubt continue in the same line of business, and be as long lived as KEELY and just as successful.

NEW PUBLICATIONS.

THE COLLIERY ENGINEER'S POCKET BOOK. 184 pages. Illustrated. The Colliery Engineer Company, Scranton, Pa., 1890. Price $2.

This is a new edition of the Mine Foreman's Pocket Book, enlarged and improved to meet the requirements of mining engineers, mine officials and mining students. It is a compilation of formulæ, tables and articles upon nearly all the subjects which engage the attention of the colliery superintendent, and will well serve its purpose as a reference and text book for such officials. Among its contents, it treats of the strength of materials, wire ropes, colliery management, ventilation, hydrostatics, hydraulics, transmission of power by compressed air and electricity, mine surveying, underground haulage, colliery machinery and faults. It also

contains logarithmic and traverse tables, squares, cubes, roots, etc. It is bound in the customary pocket book style and will be a useful little book.

THE CIVIL ENGINEER'S POCKET BOOK. By John C. Trautwine, C. E. Fifteenth edition. Fortieth thousand. Revised by John C. Trautwine, Jr., C. E. 832 pages. Illustrated. John C. Wiley & Sons, New York, 1891. Price, $5.

It is quite unnecessary to refer to the merit of this valuable and well known pocket book, as its reputation is sufficient. It is the indispensable companion of the engineer in the field and is always kept close at hand in the office. There is no other hand book which has the general usefulness of Trautwine's. The work was so thoroughly revised in its ninth edition (twenty-second thousand, 1885) and so greatly enlarged as to be almost a new book. Since that time the demand has been so great as to call for a new edition every year, each one containing such additions as to make the work include the latest information in each branch of engineering with which it deals. In the present edition the principal new features are the greatly enlarged article on Weirs, with suggestions for measuring small weirs, and that on Centrifugal Force. Minor changes have also been made in many other places.

SOUVENIR OF THE COMSTOCK. Illustrated. Photographed and copyrighted by James H. Crockwell, Virginia City, Nev., 1890. Price, $2.

This little volume contains a series of photographs showing the most prominent buildings of the mining camp that was once so famous. It is prefaced by a short sketch from the pen of a local celebrity, Dan De Quille, who in a few words gives an outline of the history of the bonanza mines. Scattered all over the West, and the whole continent for that matter, there are certainly many who will like some souvenir to recall to them the stirring events connected with the city on the side of Mount Davidson. Just such a little volume is this. The pictures, made by the Albertype Company, of New York, are, with some exceptions, very good and vividly recall the place. The view of the city from Cedar Hill with which the volume opens, is excellent, and is followed by nineteen other plates, conspicuous among which, in point of artistic merit, are the "C. & C. Pan mill," the Nevada mill and the Carson River mills. The plate showing the miners of the Comstock as they work under ground, is hardly a success and might well have been omitted or replaced by a better one. The book is exactly what the title indicates, and will fill a want which has doubtless frequently been felt.

PUMPS, HISTORICALLY, THEORETICALLY AND PRACTICALLY CONSIDERED. By Philip R. Björling. 222 pages, with 156 illustrations. E. & F. N. Spon, London and New York, 1890. Price $2.50.

Mr. Björling is the author of two smaller works than this, viz.: Practical Handbook on Pump Construction, and Practical Handbook on Direct Acting Pumping Engine and Steam Pump Construction. In these earlier books, which are quite elementary in their nature, he treats of the leading features of the styles of pumps most generally in use. In the present work he has followed quite a different plan, making a research into the history of pumps, which carries us back to the time of Hero of Alexandria, 200 B. C. and traces the course of invention in pump construction from that date down to the present time. There is a large gap in the history from 120 B. C. to A. D. 1511, during which there is no record of any improvement in pumps being made, but from 1618, the date of the first British patent on pumps, the number invented has been legion. Mr. Björling has apparently made an extensive study of the pump literature of the last 200 years, a large portion of which is in the records of the British patent office, and he has rescued from oblivion a great number of designs which have fallen into "innocuous desuetude." In so doing he has done a service to would-be inventors of new pumps, if they will read his book, by showing them that most of their ideas have been anticipated. At the same time he has given us a most interesting history of the origin of the leading varieties of pumps which are now in general use. More than three-quarters of the book is devoted to this historical study, and in the remaining part the author briefly treats of practical features in designs of pumps, their classification, advantages and disadvantages of different types, etc. The word "theoretically" we think should be omitted from the title, as the book contains very little matter of a theoretical nature. This, however, to the average reader, will not be considered a disadvantage. It also leaves an opportunity open for the author to write a fourth book on pumps, treating them philosophically and theoretically, of which we hope he will avail himself. The present work is an excellent one, as far as it goes.

A DESCRIPTIVE TREATISE ON CONSTRUCTIVE STEAM ENGINEERING, embracing engines, pumps, boilers and their accessories and appendages. By Jay M. Whitham, M. E., C. E. 900 pages, 795 illustrations. John Wiley & Sons, New York, 1891. Price $10.

Professor Whitham is the author of a work on steam-engine design, which has been largely adopted as a text and reference book in engineering colleges. In the present work, design is not discussed to any great extent, but the constructive features of nearly all modern forms of boilers, engines, etc., is exhaustively dealt with. The plan of the work includes a brief classification of the various types of engines, a chapter on heat and steam, discussion and illustration of constructive details of an engine, a chapter taken from the author's earlier work on the use, operation and setting of slide valves and independent cut-offs, a discussion of the various forms of valve-gears and of engines of the principal types, and their miscellaneous attachments and minor details. The theory of combustion and the types of boilers are treated in one chapter, and their constructive details and strength, in another. The last chapter relates to all of the appendages and accessories of boilers, their decay, management, etc.

In so far as the book is confined to the subject indicated in its title, it fills a "long felt want" in presenting in one volume a vast number of illustrations and descriptions showing how modern engines, boilers, pumps, and their appendages are made, giving in convenient shape a mass of information which is usually found only by a troublesome search through catalogues of builders. In so far as it departs from its title in giving matter that is already printed in numerous text books, the work is no better or worse than most others which treat of the same subjects. Thus in Chapter IV., from page 136 to 211, we have discussions of indicators, methods of calculating indicator diagrams and the like, which might have been improved by leaving out all the matter which is already sufficiently well treated in numerous books on the indicator. So the 35 pages devoted to the study and design of valves by the Zeuner diagram, the 50 pages in Chapters X. and XI. on engine trials, dynamometers, theory of combustion, etc., and a few other pages here and there throughout the book on engineering theory, might have been left out with the advantage of making the work truer to its title, less bulky and lower in price. Chapter V., on Zeuner's method of analyzing valve gears, is stated to be taken by permission from the author's own work on "Steam-Engine Design." We think it would have been better for the publishers to have refused the "permission" and to have induced the author to condense the book into smaller bulk, so as to enable them to sell it for less than $10.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

Technical Writing.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: You have never lost an opportunity to tell young engineers to write about their work if they would be known; and the same advice has occasionally been repeated in your columns by eminent engineers. I was particularly impressed concerning this subject by the letter of Dr. Peters, printed in your issue of December 6th, 1890, in which he hammered home the advice by the remark that "the reputation gained by giving valuable information to the profession will, if only from a *money standpoint*, bring infinitely more profit to him who publishes it than it would to preserve it for his own private benefit, with the fancied idea that it is going to give him an advantage over his competitors." The italics are mine.

I am led particularly to refer to this matter in the present instance by my own recent experience. I wrote an article upon the chlorination of gold ores, which was printed in the ENGINEERING AND MINING JOURNAL of December 20th, 1890, and since that time I have received no less than ten communications regarding it from various places between Montana and Mexico. As an immediate result of these, I am now, with Mr. S. R. Krom, of New York, preparing the designs and plans for one contract, and am in negotiation for two others. This is very practical proof to me of the value of technical writing, and also of the manner in which the ENGINEERING AND MINING JOURNAL is appreciated. If you prick the public through your columns it will respond sooner or later.

151 CEDAR ST., NEW YORK, Feb. 6. CHARLES BUTTERS.

Mining Notes from Honduras and Guatemala.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The following mining notes, which I gathered during a recent visit to Honduras and Guatemala, may be of interest to your readers. Unless war interferes there will be a considerable movement in the mines of Honduras this year, with some prospect of better results than heretofore. The river mining at Retiro last year was not a financial success. Major E. A. Burke, the promoter of that and other enterprises of like character, informed me that the gravel yielded over 60 cents per cubic yard, but the work cost over $1 per yard. Major Burke leased the mine toward the close of the season, and he claims that by an improved system of handling the gravel, by means of an elevator, he reduced the cost to 12 to 15 cents per yard; hence his hopes of ultimate success, the floods having stopped the work for the season. This should be a good year for such work, as last year was very dry. The Santa Lucia Company, when I left, had two months work to do in order to put the mine and mill in good condition, and I think that if that is done they have enough pay ore accessible to occupy the mill for a year, besides two known ore bodies to be reached by further extension of the lower tunnel.

The Rosario was about to start again with a large quantity of ore in sight. The works at Angeli Valley, which have been for some years supplying the government with silver for coinage, from a few small furnaces, were to be enlarged, and it was expected that a 40-stamp gold mill would be erected on the Dos Hermanos mine in Cholutica. The Victoria Company near Santa Lucia, with a large concession, supposed to be defunct, also was showing signs of life.

Major Burke has vast concessions of mineral lands, and is a very enterprising and liberal gentleman. Among others he has a silver mine near Guaymaca, which promises well. I did not see the mine, but the ore was very good and "free milling." From a mine near Cedros I saw some splendid argentiferous galena.

A new mineral has been found at Guscaran, where a Californian company has a lixiviation plant. The mineral is said to be a compound of selenium and tellurium, and has been called Durdenite after the Secretary of the California State Mining Bureau.

In Guatemala but little attention is being paid to mining, though one mine which is being worked is paying well. The ore of this mine is to a great extent oxidized, yet it is treated by roasting and amalgamation, requiring from 10 to 12 per cent. of salt. This seems to be because a large part of the silver is in the form of arsenate and antimonate, but I think, and it seems probable, that it might be successfully treated by lixiviation, with or without the Russell process, perhaps without roasting, or roasting with a small percentage of salt on account of a certain proportion of arsenical pyrites which it contains. The company declined, however, to pay for an investigation, having, they say, only one year's ore in sight.

There is a mine of good mica, the property of Mr. David B. Rea, and also one of asbestos but not of very good quality. I saw a lump of iron ore which came from a deposit in that country, and a little rich gold quartz; for the rest, however, the specimens shown to me were little better than trash.

Enterprise in Guatemala is chiefly directed to coffee, which is bringing several millions clear profit annually to the country. When coffee drops, mines may possibly have a chance. Guatemala is a fine city of its class, with a delicious climate. It is active and progressive, and, while I was there at least, the hotels and boarding houses were all full. C. H. A.

SAN FRANCISCO, January 25.

HYDRAULIC TRAVELING CRANES.*

By Erwin Graves, Camden, N. J.

In this paper my purpose is to describe a traveling crane devised by myself, in which the actuating power for each of the various motions is obtained independently and from hydraulic pressure. I believe this application and arrangement to be new, and to possess merit.

Fig. 1 shows a bridge with ends mounted upon carriages fashioned to move along tracks on wall. On one end of bridge are secured two horizontal grooved wheels, *C* and *G*, and at opposite end, one horizontal wheel. The trolley *T*, which is free to move along the bridge, has, as shown, four vertically hung grooved wheels. At some point, as in one corner of building, is located a cylinder and plunger with sheaves, and rove with a wire rope, as shown. This wire rope leads over the wheel *B*, thence horizontally along the wall and around the wheel *C*, thence around one of the wheels in the trolley, and down, and under the wheel in the fall-block, and up, and over the wheel in the trolley, and to the wheel *E*. After passing around this wheel, it is returned in same manner around the trolley and fall-block wheels to the wheel *G*, from which point it leads to and is secured at *H*. It is clear that, with an object suspended from the fall-block, the trolley is free to be moved along the bridge; also, that the bridge is free to be moved along its track, and that such suspended load can be brought over any point within the rectangular space covered by these motions. The pushing out of the ram results in lifting the fall-block; and the rope being passed twice about the cylinder and ram sheaves, one foot of motion in the ram produces an equal amount in the fall-block.

By adding to the wheels and coils of rope about the cylinder and ram, the ratio of travel between the ram and fall-block can be made 2 to 3, 1 to 2, or even more, where a high lift may be required with a short stroke. Hoisting of a load is accomplished simply by admitting water under pressure into the cylinder; the holding suspended of a load, by cutting off such supply of pressure water; and the lowering, by allowing the water in the cylinder to escape. The speed of hoisting and lowering is thus entirely within the control of the operator.

The sudden "running down" with a load is impossible, from the nature of the power.

The next step is to produce the motion of the bridge along its track. In

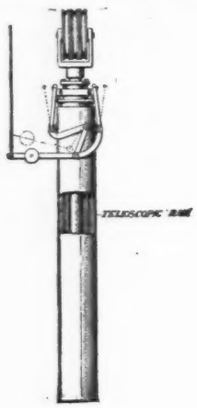


FIG. 4.

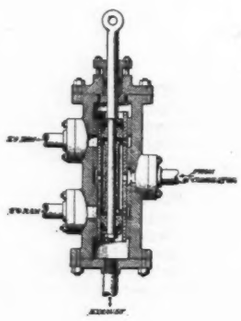


FIG. 6.

Fig. 2, *A* and *B* are two cylinders with rams, and are duplicates of each other, both being provided with wire-rope wheels, as shown. The most convenient location for these is in the opposite ends of the building and near one corner. The ropes, after passing about wheels on cylinders and rams, lead to and are secured at opposite sides of the bridge at *C*; the lengths of these ropes are so adjusted that, with the bridge in the middle of its travel, the rams are at half stroke. The length of rams and combination of coils are such that one stroke hauls in a length of rope equal to the travel required of the bridge. With rams arranged as shown, and pressure water admitted to both cylinders, the maximum strain will be put upon the ropes; but as this pull is equal, and in opposite directions, there is no effect in the way of moving the bridge. Suppose, now, that by means of a valve the pressure is cut off from the cylinder *A*, the pressure connection with *B* still remaining open, this will produce no motion; but go a step further, and permit water to escape from cylinder *A*. It is evident that the holding force acting on the bridge through the ropes about *A* is released, and that the pulling force from the cylinder *B* will produce a motion to the bridge in that direction; also, that there will still be a strain upon the ropes from *A* equal to that from *B*, less the pull consumed in moving the bridge. By reversing this operation, motion to the bridge in the opposite direction is produced. A form of valve for producing these results in the proper way, by a simple lever motion, will be described farther on. As in hoisting and lowering, it is clear that the valve controls all speeds, from the fastest to the slowest.

The means of moving the trolley upon the bridge is illustrated by Fig. 3. Here are shown, as located horizontally in one end of the building and at the level of the crane, two cylinders and rams with sheaves, and having ropes rove about them. The cut shows how these ropes pass along the wall, out over the bridge to the trolley, back to and along the wall to the opposite end of the building, where the ends are secured. When pressure is admitted to both cylinders, the resulting pull through the ropes is in opposite directions at the trolley, holding it in one position upon the bridge, but the bridge remains free to be moved along its tracks. By the same process of cutting off, exhausting, and reversing the water supply, as described for the bridge-moving rams, the requisite motions in both directions are obtained, and with the same range of speeds.

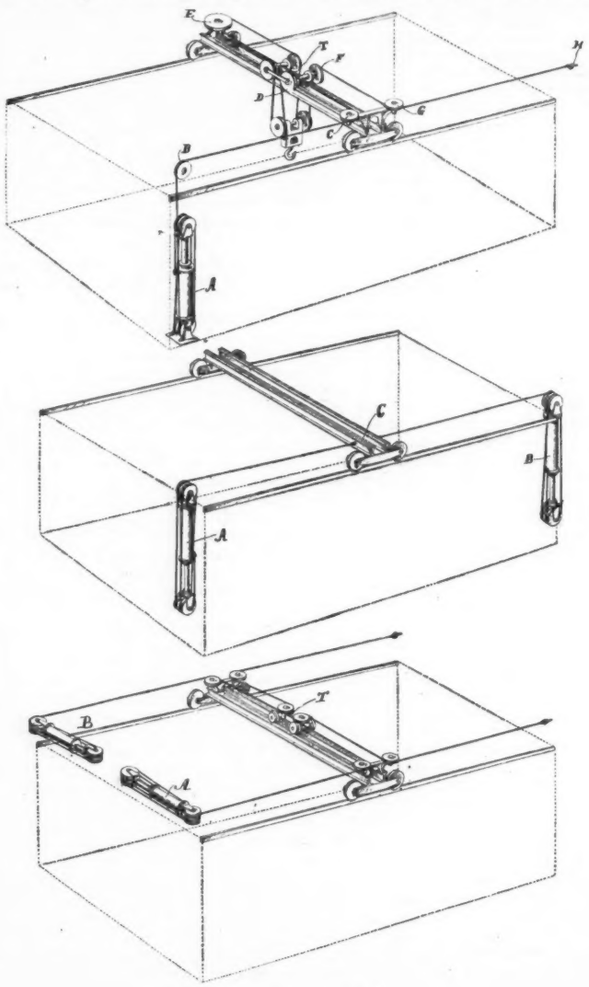
* From a paper read at the Richmond meeting of the American Society of Mechanical Engineers, November, 1890

Fig. 4 shows a well-known form of hydraulic valve, modified so as to operate the bridge-moving and trolley rams in the way described, and, by omitting one of the ports, the hoisting and lowering also. As shown in the cut, the piston is in the middle of its stroke, and it will be observed that both ports admitting pressure to the rams are slightly open; this results in the rams pulling against each other, as described. A slight motion of the piston in one direction closes one of these ports, and opens wider the way for the pressure supply through the other; further motion to this valve piston begins to open the way for the cut-off cylinder to exhaust. The result of this is motion to the bridge or trolley, and the speed of such motion is controlled by regulating the rate of the exhaust.

Fig. 5 shows a design which may be used up to 25 tons capacity or more. In this the bridge is simply a box girder, in which vertical strength and lateral stiffness are obtained in the most direct manner, and the end carriages, rope-wheel brackets, trolley, and fall-block are of the simplest construction.

For light capacity cranes, the bridge may be two I beams, connected only at the ends, and with the trolley working on the top flanges; the fall-block being suspended between the beams by two parts of rope only. Otherwise the general arrangements would remain the same, except that the hoisting rope, in leading back across the bridge to its primary end, would not engage with the fall-block. In such a case, with the same combination of ropes at the hoisting ram, a given stroke would produce double the hoist at the fall-block hook.

In these hydraulic traveling cranes the most desirable locations for the



FIGS. 1, 2 AND 3.

operating rams are: Hoisting cylinder with ram working upward, and placed in one corner of room; adjoining this, one of the bridge-moving cylinders, with ram working vertically downward, while in the corresponding position in opposite end of building would be the other bridge-moving ram. The trolley-moving cylinders and rams may be located horizontally on the end or side walls. These locations permit of the ropes being led in the most direct manner to the bridge, without intervening sheaves. Should circumstances demand, any of these cylinders can be located elsewhere, or they may all be located at one point. It is desirable, however, that the bridge and trolley rams should either act downward or horizontally, so that during nights and at other times when the pressure may be off they will remain in position in the cylinder—not dropping down and deranging the ropes.

When, as is usually the case, there has to be performed a variety of lifting, both light and heavy, it is desirable, both for economy of power and increased speed, that rams of smaller diameter be employed for the lighter work, holding in reserve the larger one for the heavy work. Fig. 6 shows an effective and cheap method for accomplishing such results and at the same time giving the operator means to make the change at a moment's notice, without leaving his station. The method is simply to use telescopic plungers, allowing two or more powers to be provided, in

which the larger ones, with the greater lifting power, are clamped down when not required. This cut will show how this is accomplished, without explanation.

The movements of the crane may be controlled by an operator stationed in a "pulpit," conveniently located to provide a clear view over the space which crane covers; this method permits also two or more cranes to be operated by one man. In such cases the valves would be placed where the operator is stationed, and pipes laid to the different cylinders. Valves, such as before described, can be combined together, so that one supply and one discharge pipe answer for all.

The application of hydraulic power to traveling cranes is not limited to those of light capacity. A design is shown for two cranes, to be placed on the same track, each of 45 tons capacity, 43 feet hoist, 50 feet span, and 300 feet of travel. In these the same simplicity and directness are obtained as in those of smaller capacity, and they are now in process of construction.

Somewhat more than three years ago I designed, for a foundry then being built, two cranes of 15,000 pounds capacity each. These two cranes were constructed, and have been in constant use over two and a half years. Their performance, under the requirements of daily work, has been satisfactory in the highest degree; during this time there have been no repairs required whatever, except one or two renewals of the flax packing in the stuffing-boxes of the rams. The care and operation of these have, for the whole time, been in charge of ordinary foundry help—one man operating both cranes. There has never been a man injured or a mishap of any kind resulting from their use. A person seeing the easy, noiseless, and rapid manner in which these cranes perform their work, and the simplicity of their parts, cannot but be favorably impressed.

The number of wheels about which the hoisting rope passes, may suggest the thought that there is here a large loss of power from friction; actual results do not show this to be the case. The loss of power from bending wire rope about wheels of such diameter is extremely small. The principal loss comes from the axle friction. The relative large diameter of the wheels, however, reduces this friction to a small amount. Tests upon the two cranes before referred to, taking them without any special preparation, just as found after a day's work, and with varying loads up to their full capacity, indicated very uniform results in the percentage of friction. In one crane the average was 9 per cent. and in the other less than 12 per cent. of the loads lifted, including dead load.

As chains are so largely used for carrying the suspended loads in cranes, it may appear to some that substituting wire rope for this purpose is attended with risk. I do not think this to be the case, however, and am further of the opinion that there are certain advantages in its use. Wire ropes possess their calculated strength to a degree unattainable in chains, the reason being that in one there is a series of links, each of which must have strength to resist rupture from the entire strain, while the other is made up of a combination of separate pieces, running throughout its length, of iron or steel in its most reliable form. In the question of costs and weights there is a difference in favor of the rope; as, for example, 100 feet of chain which has an estimated ultimate strength of 28,000 pounds, would weigh over 500 pounds and cost over $37, while its equal in pliable wire rope would weigh but 60 pounds and cost less than $11.

Where the exigencies of the case demand, steel-wire ropes can be used on wheels with diameters as small as 25 times that of the rope for smaller sizes, and 35 diameters for the larger sizes. Such diameters, while much less than the rope manufacturers advise, will be found to give very satisfactory results, though it is good practice to use larger wheels where such can be employed. To give an idea of what may be expected in the way of lasting qualities, I may state that in the 15,000-pound cranes referred to, after over two and one-half years of constant service, the ropes are so little worn that they would appear to be good for an equal further use.

Where the strain is greater than can be carried by one rope of moderate size, or the necessary diameter of wheels inconveniently large, two smaller ropes can be used, the wheels being properly grooved and both ropes passed about them, as though but one was employed, the fixed ends being secured to an equalizing bar, so that they will be strained alike.

With the application of hydraulic power to traveling cranes, I believe that there will be found the following advantages: General adaptability, moderate cost and simplicity of construction, freedom from repair, ease, safety, rapidity and noiselessness in action, and economy of operating power.

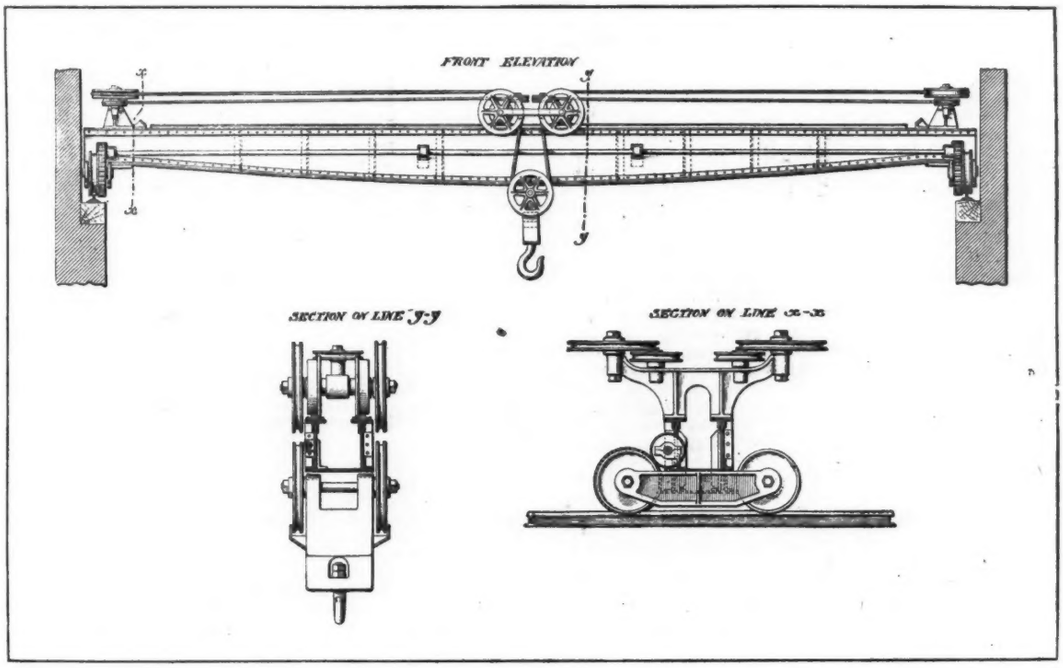


FIG. 5.—TRAVELING CRANES.

THE PRACTICAL CHLORINATION OF GOLD ORES AND THE PRECIPITATION OF GOLD FROM SOLUTION.

Written for the Engineering and Mining Journal by John E. Rothwell, Mining Engineer.

Referring to the several valuable communications recently published in the ENGINEERING AND MINING JOURNAL on this subject, allow me to contribute my quota, the record of actual, successful working experience on a large scale.

The chief objection to a plant of 50 tons or more capacity in 24 hours for the Plattner process is its enormous size and the length of time it requires to complete a single operation. Therefore, the problem the engineer has to solve when he attempts to handle low-grade ores that will not concentrate, is to find a process that will handle his ores in large quantities quickly, cheaply, and with as little interruption as possible. It may therefore be of interest to some of the profession to hear of one solution of this problem that has been demonstrated beyond a doubt.

In the reduction works of which this article treats in particular, the ore is crushed dry in Blake and Gates crushers and two sets of Krom rolls, roasted in Brückner furnaces of three tons capacity, and chlorinated in barrels of three and four tons capacity.

Crushing.—The first thing to be considered in treating an ore, is to crush it properly; to do this, a series of experiments has to be made to ascertain how coarse the ore may be to give the best result in the after-treatment, with reference to economy, large capacity, and best extraction. The pulp for the best leaching must be in granular condition, and carry as small a percentage of dust or slimes as possible. For this purpose rolls properly managed are especially well adapted.

A few lessons from experience with rolls may not be out of place here. The chief point is to have enough of them to make the reduction in size of particles passed through them, gradual. Two sets are sufficient, but three will do better. The ore should come to the coarse rolls not coarser than ½-inch mesh, and these rolls should be set about ⅜ inch apart. The middle rolls are set about $\frac{1}{16}$ inch or less apart, and the fine rolls about as far apart as the size to which the ore has to be crushed. If only two sets are used, the coarse are set a little closer than with three, and the fine remain the same.

The springs should be set up so tight that they will not give to the hardest pieces of ore, but will allow a piece of steel or iron to pass through without throwing the belts. The periphery speed of the rolls should be about the same as, or a little faster than, the falling speed of the ore,

and the ore should be fed in an even sheet across the surface of the roll; little trouble will then be experienced in keeping the surfaces true, and in producing a granular pulp carrying but a small percentage of dust. If rolls were made of larger diameter and narrower, the result would be a still more gradual reduction, and possibly a greater capacity. I have used those of 39½ inches (1 meter) diameter and 12 and 15 inches face.

Roasting.—The roasting of the ore is one of the most important operations in its influence on the success of chlorination, but as the characteristics of each ore must be studied, none but general rules can be laid down as to how roasting should be done. It is absolutely necessary that the ore be roasted as nearly dead-sweet as possible.

Chlorination.—The chlorination barrel in the works of which I have charge is made also the washing and leaching vessel; this is done by placing a supporting diaphragm, for a filtering medium, to form the chord of an arc of the circle of the barrel. The diaphragm, or filter as it is called, is made up of plates, corrugated similar to the ordinary filter-press plate, and perforated with holes every 4 or 6 inches square. These plates are supported on segments which are bolted to the shell; on top of the corrugated plates is placed the filtering medium, an open-woven asbestos cloth. It is about as coarse as the ordinary gunysack, but the warp and woof are of much heavier thread. Over this is placed an open grating, and the whole is held in place by cross pieces, the ends of which rest under straps bolted to the inside shell; in this way, while the whole is rigidly held in place, it is very easily and quickly removed when the changing of the asbestos cloth becomes necessary.

Two valves on each end of the barrel above and below the filter are for the inlet and outlet of the wash water and solution respectively.

The barrel is charged by first filling the space under the filter with water, which at the same time is allowed to pass through the filtering medium and wash it; then the required quantity of water is put in above the filter. There are now two methods of charging the pulp and the chemicals, lime chloride and sulphuric acid. In one, the lime is so placed in the ore charge in the hopper over the barrel that it goes in with the ore and is completely buried with it; the acid can then be added with very little danger of generating any gas before the plate on the charging hole can be put on and securely fastened. The other way, which seems to be still better, is to pour the acid first, into the water, through which it sinks in a mass to the bottom and does not mix; the ore is then let in, and the lime added the last. The chances of generating any gas are much less than in the first method. I have seen the barrel charged in this way remain open for from five to ten minutes after charging without generating gas; but it has been demonstrated that on the first revolution of the barrel the gas is immediately liberated, and creates considerable pressure. After the chlorination is complete the barrel is stopped, so that the filter assumes a horizontal position; the hose is attached to one of the outlet pipes and conducts the solution to the reservoir tank.

A hose is also attached to the inlet pipe, and water is pumped in under pressure, and the leaching commences. The air in the top part of the barrel is compressed and forms an elastic cushion, which gives the wash water perfect freedom to circulate evenly over the whole surface of the charge, and wash every portion of it thoroughly and with the smallest quantity of water possible. By washing in this manner no gas is allowed to escape into the building; the solution runs into a covered reservoir tank, from which an exhaust fan draws the excess of gas and discharges it outside the building.

The length of time required to do the leaching varies with the leaching quality of the ore treated—charges having been leached in 40 minutes with a pressure of from 30 to 40 pounds per square inch. With higher pressures the time can be materially shortened.

As can readily be seen, the ore in the barrel is in the best possible shape for rapid and perfect leaching. When the barrel is stopped the ore settles on the filter, the coarsest and heaviest on the bottom and graduated evenly over the whole surface and up through the charge to the slimes on top.

In order to facilitate the leaching of charges carrying an excess of dust or slimes, a valve placed in the casting of the head, on a level with the surface of the pulp, is opened just after the barrel is stopped, and the dust and slime which remains in suspension is run off into an outside washing filter press, where it can be treated separately, and the charge washed in the usual way.

The tailings are discharged into a car which will hold the whole charge of ore and water, and then run out; or, if water is abundant, they are discharged into a sluice and washed away.

For leaching purposes, the amount of water necessary to wash a charge varies very little with the richness of the ore, which goes to show the perfect leaching condition of the ore in the barrel. The amount required is about 120 gallons per ton more than the quantity used in the barrel for chlorination, which is about 100 gallons per ton.

In order to get a concentrated solution for after-treatment, and to reduce the amount of solution to be treated, also saving in water, a tank is placed above the barrel, and when the richest of the solution and wash water has run out into the reservoir tank the discharge hose is connected with the pipe leading to the upper tank, and the washing is finished into it. The solution collected in this way is used in the next-following charge in the barrel; the quantity of solution to be precipitated is thus reduced to about 120 gallons per ton of ore treated.

The advantages of this method of treating ores are many, among which may be cited: the small amount of labor, and especially of skilled labor, necessary; the freedom of the building from chlorine gas; the control one has over the perfect washing of the charge; the small amount and simplicity of the machinery for the great amount of work accomplished.

One man of ordinary intelligence and a helper are able to take care of three barrels, that is, look after the charging, leaching and discharging. If the tailings are sluiced out, they can also attend to it; but where they have to be trammed out, one more man is necessary.

The disadvantages are due to the construction necessary, but do not interfere in any way with the successful working of the barrel; they are, principally, the amount of space taken up by the filter and the portion of the barrel under the filter, and the fact that when the barrel is charged and running, it is not in a perfectly balanced condition.

These disadvantages can be got over to a great extent by a little different construction. By using a filter placed close to the shell, only space enough being left between it and the shell to allow of free circulation, and reaching to the same height on the sides as the *horizontal filter*, then by using compressed air to displace the solution and wash water, an equally good result could be had.

Precipitation—The Asbestos Filter Cloth, etc.—For the collection of the solution, two tanks are necessary, each of ample capacity to hold a day's solution from all the barrels. Those for collection are placed on the same floor as the chlorinators, or, where there is sufficient fall, on the floor below; then on the floor below them, are the precipitation tanks, which should be of the same capacity as the collecting tanks, and the same in number.

The limit to the size would probably be a 50-ton capacity; where more is treated another battery of tanks would be necessary.

For a precipitant, the writer has found hydrogen-sulphide gas, generated from paraffine and sulphur or iron sulphide and sulphuric acid, to give the cheapest and most satisfactory results. It is generated, and then forced through the solution with a small air pump, which, at the same time, forces air through and keeps the tank of solution in an agitated state, and expels the free chlorine gas. In this way a precipitation can be made in a short time, and the precipitate is in a collected and flocculent form, that settles quickly.

To save time, the gas is turned into the tank while this is filling up, so that when the tank is full a very few minutes finish the precipitation and collection.

The tank is now allowed to stand for two or three hours, when it has settled sufficiently to draw the supernatant liquor off through a filter press.

There is little danger of precipitating arsenic or antimony that may be in the solution, when it is worked cold, as they do not commence to come down till some time after the gold has precipitated and collected.

Of course any copper or lead in solution will be precipitated with the gold, which would not make this precipitant desirable where there is considerable of either metal in solution; but with small quantities they are easily taken care of in the after-treatment.

The loss in gold is considerably less if the precipitate is allowed to accumulate in the tanks, and a clean-up made after six or ten precipitations, than if it were filtered through a press and collected after every precipitation.

There does not seem to be any advantage derived from a continuous precipitation and collection on this account, if hydrogen-sulphide gas is used as the precipitant, as the filters will soon become so coated and clogged with the sulphides as to retard rapid filtration, without extreme pressure, which is sure to increase the loss. The handling of a large number of filter cloths is also a source of loss, no matter how carefully it may be done. The same objection applies to all continuous precipitation schemes, where large quantities of solution are handled.

The asbestos filter cloth can be changed in about one hour and a half, and under ordinary conditions will last for upward of 100 charges. One cloth has been known to last 150 charges, so that this objection to the filter inside the working barrel is really nil.

The life of the supporting plates and grating can be made to equal the life of the lining of the barrel, and that with barrels that have several thousand charges to their credit shows little signs of wear yet.

DEADWOOD, S. D., January, 1891.

WEDDING'S BASIC BESSEMER PROCESS.

Of this work, recently published by the Scientific Publishing Company, the *American Manufacturer and Iron World*, in its issue of January 16th, says:

'It is a singular fact that while the first discovery of a successful method of manufacturing steel from high phosphorous ores by the Bessemer process, now known as the Basic-Bessemer process, was made by an Englishman, the process has received but comparatively meager development in England or among English-speaking steel manufacturers, but has reached a high state of perfection in a foreign country, Germany, and the only authentic literature devoted specially to the subject has been in the German language.

What literature there has been, however, has been of a high class, coming from the able pen of Dr. Herman Wedding, of Berlin, than whom there is no better authority in this department of metallurgy. We are now so fortunate as to have a translation of Dr. Wedding's work in the English language, and it is a most valuable addition to the English literature of metallurgy. We give below a brief outline of the work.

In Chapter I. the early methods of treatment of the high phosphorous ores, since successfully operated upon by the basic process, are reviewed. In this chapter much of historical interest concerning the development of the process and the different steps in the successful solution of the problem is given. The experiments of Krupp, Bell, Thomas and others, who laid the foundation of the present success, are briefly though clearly recorded, and form an appropriate introduction to the technical discussion of the present systems of practice, given in detail in succeeding chapters.

[A summary of chapters II. to IX. follows here.]

Chapter X., though shorter than several others in the book, is of no less interest to the practical steel manufacturer, for here are given the economical results of the Basic-Bessemer process as carried out in the leading German works. At the Ilsede works, where the conditions for manufacture are especially favorable, the cost of pig is put at below $10 per ton, and the cost of converting at $5.36 to $7.65 per ton, this including interest, sinking fund, etc.

Germany has now 14 separate establishments, with 36 converters, with 5 now building; Austria, 3 plants with 7 converters; Russia, 1, with 2 converters; Belgium, 2 establishments, 4 converters; France, 5 works, comprising 13 converters; England, 6 plants, with 22 converters; North America, 1 plant, 2 converters. A total of 32 works, 88 converters, with an aggregate capacity of 795 tons. The total yearly output, when works now building are completed, is put at 1,196,000 tons.

At the close of the volume several pages of notes on the different works mentioned in the text, minor details of practice, etc., are given.

The book is copiously illustrated with drawings and folding plates, the typographical work is excellent, and the whole book reflects credit upon the translators and others who have been instrumental in bringing out this latest addition to English metallurgical literature."

THE MAMMOTH MINE DISASTER.

From our Special Correspondent at Pittsburg.

Shortly after nine o'clock on the morning of January 27 occurred one of the most appalling disasters ever recorded in the annals of coal mining. There was an explosion of fire-damp, ignited probably by a miner's oil lamp, in the Mammoth mine of the H. C. Frick Coke Company, and with the succeeding after-damp 107 miners were swept into eternity.

The Mammoth mine is located in the bituminous coal region of Westmoreland County, on the Sewickley branch of the Southwest Pennsylvania Railroad, and is one of the important mines of the famous Connellsville district. It is the largest mine owned by the H. C. Frick Coke Company, and when operated at full capacity has made an output of from 550 to 600 tons of coal per day, several hundred men being employed. The mine has two entrances, one known as the shaft and the other as the slope. It was purchased by the company in September, 1889, and operations were commenced during the following month.

The story of the disaster is soon told. A few minutes after nine o'clock a faint puff of dust rolled from the mouth of the shaft, but nothing more to indicate what had happened. An unexpected flow of gas had been encountered and every one of the miners working in the headings connected with flats Nos. 2, 3 and 4 had been killed.

An increased volume of air was forced into the pit and a rescuing party organized and sent in to do whatever might be done. Descending the shaft and proceeding along the main gangway, about 300 feet from the shaft they encountered a fall of rock, caused by the explosion. Empty cars, completely wrecked, and the bodies of men and mules were piled against it. So solidly had the mass been wedged by the force of the explosion that it was with difficulty that a passage could be effected.

In the chambers beyond, where the men had been working, there was a scene of almost indescribable confusion. The mine had been badly wrecked, and amid the débris were strewn the bodies of the unfortunate miners who had entered the mine that morning. Not so many, apparently, had been killed by the explosion as by the suffocating after-damp, as was evinced by the fact that only a small proportion of the bodies had been mangled or bruised. Not a living soul could be found, however, so thoroughly had the explosion swept the mine, and its exact cause must, consequently, forever be shrouded in mystery. The number killed has been determined to be 107, and among them was William Snaith, the fire boss, whose duty it was to inspect the mine before the men entered it for work.

As soon as the nature and extent of the explosion became known, a committee from the State Legislature, consisting of Senators Thompson and Hines, and Representatives Mullin, Farrell and Davis, was instructed to proceed to the scene of the disaster and make an investigation for the purpose of seeking its cause, and report upon what additions might be made to the State mining laws to prevent such calamities in the future. The investigation was commenced upon the 2d inst. Some thirty or forty miners who had worked in the mine were examined, and testified that it had, hitherto, been free from gas and that no danger had been feared. They had entered the mine with no thought of death, and naked lamps were the only ones used, except that the fire boss, who entered the mine first in the morning and made a tour of examination, carried a safety lamp. It was his duty to go to the face of each working and indicate by a chalk mark that he had been there. Whether he had done his duty on the fatal morning of January 27th of course could not be determined, as he was among the killed. The general opinion was that he was a capable man, but was addicted to a liberal use of intoxicating liquors. It was thought also that the work was too much for one man.

Among others examined were Thomas Lynch, general manager of the H. C. Frick Coke Company, Superintendent Keightly, of the mine, mining boss Eaton, and mining inspectors Adams, Lonttit, Duncan, Blick, and King. Various opinions were expressed by these gentlemen concerning the management of the mine. The origin of the explosion, so far as could be determined, had been in the first butt of the third flat about 30 feet from the heading. It was thought that, while the ventilation of the Mammoth mine was fair, it certainly was not what it might be and that more air should be provided, and that the currents should be more extensively split; that every part of a mine should be examined whether working or not, and that the use of safety lamps should be made compulsory.

If these precautions had been complied with at the Mammoth mine there is no doubt that the aweful catastrophe would not have happened. As one of the witnesses before the legislative committee remarked, "Most of the great explosions of fire-damp in collieries in this country have been where it has been claimed that there was no sign of gas." The investigation will be continued in Harrisburg, and will undoubtedly lead to a revision and further strengthening of the mining laws of Pennsylvania. The H. C. Frick Coke Company has given $25,000 toward the relief of the families of the dead miners, the fund being distributed by a committee of five. Our illustration shows the surface of the shaft in the workings from which the explosion occurred.

THE MAMMOTH MINE.

EFFICIENCY OF AN ELECTRICAL PUMPING PLANT.

The chief engineer of Messrs. Locke & Co., of Normanton, England, has furnished some interesting figures in regard to an electrical pumping plant used in one of the mines of that company. Above ground there is a pair of 20½ × 48-in. engines running at 20 revolutions per minute, driving two series dynamos giving 690 volts and 59 ampères. The current from each dynamo is carried into the mine by an insulated cable about 3,000 feet long. There they are connected to two 50 h. p. motors which operate a pair of differential ram pumps with rams 6 inches and 4½ inches in diameter and 24-inch stroke. The total head against which the pumps operate is 890 feet. Connected to the same dynamos there is also a set of gearing for driving a hauling plant on a continuous rope system, and a set of three-throw ram pumps with 6-inch rams and 12-inch stroke can also be thrown into gear. The connections are so made that either motor can operate any or all three of the sets of machinery just described. Indicator diagrams carefully taken some time ago gave the following results:

Friction of engine	6·9 h. p.	9·4%
Belt and dynamo friction	4·8 h. p.	6·5%
Leads and motor	6·7 h. p.	9·4%
Motor belt, gearing and pumps empty	10·2 h. p.	14·0%
Load of 117 gallons through 890 feet	31·5 h. p.	43·1%
Water friction in pumps and rising main	12·9 h. p.	17·6%
	73·0 h. p.	100·0%

At the time when these data were obtained the total efficiency of the plant was 43·1%, but in a later test it rose to 47%.

Solvay & Co 's Alkali Works.—According to the Journal of the Dutch Society for the Promotion of Industry, the production of soda in the combined works of Messrs. Solvay & Co. has risen from 3 cwt. in 1864—when it was first commenced—to 400,000 tons in 1889. The latter figure represents about one-half of the world's consumption. The Société Solvay & Cie. owns, in addition to the immense works at Couillet and Varangéville-Dambasle in France, three factories in Germany (Sarralbe, Wyhlen and Bernburg), one in Russia (Beresniki), one in Austria (Ebensee), and one in the United States (Syracuse).

Minerals Found in Alaska.—The following minerals have been found in Alaska: Pyrargyrite at Sheep Creek, stephanite at Sheep Creek, native silver at Sheep Creek and Glacier Bay, petzite at Berners Bay, chalcopyrite at most camps, bornite at Sumdun Bay, tetrahedrite at Sheep Creek, malachite at Sheep Creek and Glacier Bay, azurite at Sheep Creek and Glacier Bay, galenite at Sheep Creek, Silver Bow Basin, Glacier Bay, etc.; cerussite at Glacier Bay and Admiralty Island, pyrite at most camps, pyrrhotite at Douglas Island, arsenopyrite at most camps, sphalerite at most camps, native arsenic at Douglas Island, molybdenite at Douglas Island (Treadwell), stibnite at Glacier Bay, anglesite at Glacier Bay, native copper at Copper River, graphite at various places, marble of fine quality on Lynn Canal and Glacier Bay, coal at various places.

SIX MONTHS AT THE CONCEPCION MINE, CATORCE, MEXICO.

Written for the Engineering and Mining Journal by W. S. Godfrey.

To the kindness of Señor Joaquin Ramos, the well-known manager of this famous mine, I am indebted for a copy of his semi-annual report, which I have translated, and of which the following is an abstract. Very many Americans, especially ore buyers, have had business with Señor Ramos, and will, therefore, find interest in anything concerning the Concepcion Mine, while his report has additional value as showing the progress which is being made in mining in Mexico. Before beginning the report a few details concerning the present policy of the company will aid in a better understanding of its affairs. The Concepcion Mine has been called, and with some reason, the great show mine of the country. That it is entitled to this place of honor, none who is familiar with the spirit of enterprise shown by its management, in so great contrast to the Chinese conservatism of other native mine operators, will dispute. The first gravity tramway ever used in Mexican mining operations was laid in the Catorce Mountains for the Concepcion Company, and is operated by it for the carriage of its ores from the mine to the wagon road. At the mine shaft, steam hoisting engines replace the horse *malacates* used for centuries by the miners of the country; an assay office with modern appliances supplants the horn-spoon assay of former days; and on the surface of the mine, cages and cars are to be seen which will be employed when shafts and levels have been put in condition for them. The Board of Directors of the company has also determined to adopt machine drills, an order for a compressor plant having already been placed with the Rand Drill Company. At Cedral, about 15 miles from Catorce, where the *Hacienda de Beneficio* (reduction works) are situated, a vast area of country is walled in for the different operations of the *patio* process, which has here been developed to a degree of perfection, nearly, and, in addition, concentrating and smelting plants are to be erected.

In the report of Señor Ramos, drainage is considered under the first section, holding, as it does, such an important place in the expenditures of this mine. Much complaint is made of delays and interruptions, due to repairs on the pumps, which are under the direction of and handled by natives, and the difficulty may be appreciated when the circumstance is explained that the only experience which the pump men bring to their present occupation is that of years in handling water with bags of hide and horse *malacates*. In the exploration work done in the mine the ancient excavations have not been neglected, and attempts have been made to straighten, repair and level the workings opened during the régime of years ago. For lack of adequate hoisting capacity, work newly begun was suspended until such time as the machinery lately purchased should be ready for operation. The east drifts, called Hidalgo and Moralos, are being driven towards the territory of the Santa Puisca and San Jose mines, which were bought by the company during the last six months. The sinking of the Pilar shaft was deferred because of the uncertainty of pumping, as already mentioned. During the year much work was done in re-opening the old abandoned workings of the mine. New connections were made, new gangways driven and flooded winzes drained.

"Systematically managed and executed, these operations have been carried on with energy. The danger, at times indeed great, was only averted by the exercise of skillful precautions, and there are no lamentable accidents to deplore," says the manager. The Moralos winzes were also drained, large quantities of waste being removed and the ground well secured. The desire for economy shown in all things led to the installation of a horse whim for an underground hoist, and this, of course, has many advantages over *tanates* (bags) when carried by men from considerable depths. Under the head *Servicio Interior*, the manager states that the gangways of the mine have been maintained in good condition and that short cuts have been gained by means of new connections. Timber and masonry have not been spared when necessary. In the Concepcion mine shaft repairs of the timbering have been made, which interfered somewhat with general operations. The means for the transportation of ore and waste, underground have been much improved, and still further changes for increased facility in tramming are to be made. The ventilation of the mine is excellent.

The prospects of the mine as shown in both old and new workings are very good. Most of the dead work in changing the operating conditions of the mine will soon be over, and exploration work will be resumed with greater energy. Upon the surface the mine dump has been enlarged, so that ore sorting may be carried on with more convenience. The terminal of the gravity road has been re-arranged to make a loop, passing over scales, so that the loaded cars may be weighed. The new machinery is almost in position, the boiler house needing to be roofed only. For better communication between the Guadalupe tunnel and the Concepcion shaft, the road has been changed, rendering the shaft more easy of access and the cost of freighting heavy goods much less. The wooden rails of the gravity road have been replaced by iron. The first incline of the gravity road, from the Concepcion shaft to the top of a hill, has been operated by a winding engine, for which steam has been conveyed a distance of several thousand feet from the boilers at the mine. To overcome this great loss in power a new boiler will be placed near the engine. The San Puisca and San Jose mines, adjoining the Concepcion, have just been purchased by the latter company. These mines were found to be in such condition, however, that it is almost impossible to carry on exploration in their upper workings, which consist of vast ancient openings, in which only the ore bag and notched ladder can be used. It is intended to open new ground in these mines by drifting from the Concepcion mine. Fifty-three shares in another adjoining property, called the Internacional, were also purchased by the Concepcion Company.

Expenditures for new machinery during the time covered by this report were somewhat extraordinary for a Mexican mining company. The Concepcion shaft is at present provided with a 9 × 14 hoisting engine, the power of which, calculated according to Mexican usage, is only equal to hoisting 50 loads of from 3,000 to 3,600 pounds of ore, from a depth of about 600 feet in 12 hours. The ore is hoisted in bags, to fill which nine laborers are employed underground and 12 on the surface to empty and carry off their contents. The exact depth of the shaft is not stated. It is said, though, that hoisting is performed below the surface with horse whims on winzes 232 meters deep. The entire drainage capacity of all appliances now in use, practically determined, is only 400 cubic meters in 24 hours. Grave considerations, deduced from theory and practice, finally decided the manager to abandon the old single-rope hoist and purchase a winding engine with double drums. In order to study the matter thoroughly the engineer, Señor Eduardo Grimault, was commissioned to visit the different mining-machinery factories of the United States, and a hoisting engine, with three boilers, flat cable, cars and other accessories, was ordered and has been received at the mine. The new hoisting engine is direct acting, and has two cylinders 16 × 48 inches, Corliss valves, with reels for flat ropes. Great economy will result from the substitution of the old hoist by the new, making a reduction in labor possible. Within a short time this saving alone will have paid the cost of the plant, which was $12,300 in Chicago. A Deane sinking pump, two Cameron pumps and a considerable quantity of pipe and fittings were bought on the engineer's visit to Chicago, and among the purchases at that time were also a steam indicator and a hydraulic pump. Twenty-five more cars were ordered for underground service. For ore sorting on the mine dump and sampling the ore, two Blake crushers and a set of Cornish rolls have been placed at the mine. The engine to run these, however, has not yet been set up.

It appears that the total production of ore from the Concepcion mine for six months ending June 30th, 1890, was 96,596·66 *cargas*, equal to 14,635·80 tons. Of this quantity 16,972·3 *cargas* (2,751·5 tons), about one-sixth of the ore mined, were sold to American ore buyers and shipped to the United States. In all 117,330 *cargas* (17,600 tons) were treated at the reduction works, 37,705 *cargas* (5,655 tons) being in stock from the mining of six months prior to January, 1890. The returns from ore sales were $343,337.88, an average of $141.80 per ton. The *patio* process was the only method of treatment employed at the reduction works. The difference between the assay value of the ore and the silver recovered was 10·34%, showing a saving of 89·66%. The cost of *patio* treatment, inclusive of cost of quicksilver and of roasting the ore, was $2.47 per *carga* of 300 pounds, which is equal to $16.49 per ton. The ore is now being granulated for the arrastras at a cost of 3.5 cents per *carga* (22 cents per ton). For melting silver, plumbago crucibles have displaced the native furnace, and at least one-half of the loss of the silver by the old method is thereby avoided. This saving, of course, far more than compensates for the extra cost of the fuel required. Within a short time an iron water-jacket furnace, now at the works, will be erected. It will have a capacity of between 15 and 20 tons, and is to be used for the smelting ores produced by the different mines.

One hundred thousand tons of tailings, the accumulated refuse of ores for years past, are available at the works, and Dr. Mills, the metallurgist in charge, after a careful and thorough examination, having advised that machinery be purchased for dressing this low-grade material, a second-hand mill at Guanajuato was bought for this purpose. This plant, which has been in service but a very short time, consists of, among other machinery, 20 stamps, 2 Brückner furnaces, 2 pans, 1 settler, and 18 Triumph tables. The capacity of this mill is to be increased to 200 tons daily, and arrastras equal to the crushing power of the twenty stamps will be retired from service. The ores now handled in reverberatory furnaces will be roasted in the Brückner furnaces. The concentrating plant will first be completed, after which the smelting furnace will be erected in a suitable location. A branch from the Vanegas railroad, which has been recently built to the reduction works, has greatly reduced the cost of shipping ore and other freight.

Because of the unprecedented outlay for improvements, of which machinery was the heaviest item, the dividends paid by the Concepcion company were smaller than usual during the past six months. During the working year beginning on the 1st of July, 1889, and ending on the 30th of June, 1890, dividends amounting to $132,000 were distributed and $1,000 per *bara* was paid during the month of July, making the total $156,000, all of which came from the profit of six months' operations. Each one of the 24 parts or *baras* into which it is customary to divide proprietary rights in a Mexican mine received a net income of $6,500 for the period of six months and, consequently, each share or *accion* of one hundred, into which the *barra* is subdivided, has been paid a profit of $65. In the last part of Señor Ramos' report is given the average cost of contract work, drifting, raising and sinking in the Concepcion mine. Drifting, mainly in cross cuts, has cost $17.67 per running meter; raising, $18.28 per running meter, and sinking has averaged $28.21 per meter. The cost of management was $5,000, which was the salary of the manager for six months, while at the reduction works $5,399 represents all salaries. Freighting cost $15,800. The silver acount shows a State tax on bullion of 2% of its value; and on this 2% there was an additional Federal tax of 25%, the total direct taxation on production thus being 2½%. Each State of the federation has the right to impose a taxation which it considers proper, but the tax seldom exceeds the 2½% levied in the State of San Luis Potosi. The ore statement in the appendix to the Concepcion report gives the total cost of mining 7,351·50 tons of ore at $137,822.24, equal to $17.38 per ton of 2,000 pounds; perhaps as much as 25% of this cost is for ore sorting, although the report does not classify this outlay, always heavy in a Mexican mine. Assessments to the amount of $39,600 have been levied since the organization of the Concepcion Company, and the whole of this sum was called for prior to 1881. The total amount paid in dividends by the company to date has been $2,847,587.89.

The Coal Deposits of Tonquin.—According to Mr. William Warren, who has examined the deposits, states the *Iron and Coal Trades Review*, the coal found at Tonquin is a semi-anthracite of the very finest quality. It contains about 87 per cent. of fixed carbon, from 7 to 12½ per cent. of volatile matter, and 2 to 3 per cent. of ash. It is free from sulphur, and is quite smokeless. One of the seams inspected measured as much as 152 feet in thickness, of almost solid coal, which can hardly be distinguished from Cardiff in appearance and other respects. The seams crop out into the sea, and up the sides of low hills which fringe the shores of the Gulf of Tonquin. The existence of these extremely large and deep coalfields has been known for many years. Three hundred tons of this coal were recently tried on a 14-knot ship the *Pathan*, and gave such excellent results that the days of Japanese coal, with its 23 to 27 per cent. ash, as compared with Tonquin's 2 to 3 per cent. ash, would seem to be numbered so far as the Hong-Kong consumption of about 60,000 tons monthly is concerned.

WILLIAM WINDOM.

The tragic death of Secretary Windom has occasioned heartfelt sorrow among the mining men of this country, among whom he had a wide circle of acquaintance. The Treasury Department of our Government occupies an important position in relation to the mining industry of the United States, not only from its financial policy, but also from the questions more directly affecting mining matters, which are referred to it for decision. Secretary Windom was thus frequently brought into contact with representative mining men, and by his courtesy and never-failing geniality won much popularity with them.

William Windom was born in Waterford, Belmont County, O., May 10, 1827, his parents, both from Virginia, being of those enterprising people who first carried the seeds of civilization across the Alleghanies. His early days were spent upon his father's farm, but after obtaining a common school education he entered a collegiate institution at Mt. Vernon, O., where he commenced the study of law. He was admitted to the bar in 1850, and two years later entered upon his course in public life, having been elected public prosecutor of the county by the Whig party.

In 1885 Mr. Windom removed to Winona, Minn., which has been his home ever since, establishing himself in the practice of law with Wheeler Sargent and Thomas Wilson, the latter of whom was afterward Chief Justice of the State. In the following year he married Miss Ellen T. Hatch, the daughter of a Congregationalist clergyman, of Franklin County, Mass. Mr. Windom soon acquired great popularity among his fellow townsmen, and in 1858 was elected a member of the Thirty-sixth Congress, as a Republican. He served continuously in the House of Representatives until 1869, during which time he had become conspicuous by his services on various important committees, having been, among others, a member of the Special Peace Committee which was formed after the election of President Lincoln.

In 1869 Mr. Windom declined further service in the House of Representatives; he was not allowed to retire from public life, however, being almost immediately (July, 1870) appointed by Governor Austin to fill the unexpired term in the Senate of Daniel S. Norton, deceased. He was elected to the Senate in 1871 and re-elected in 1877. While in the Senate he served as chairman of the Committee on Appropriations and the Special Committee on Transportation Routes to the Seaboard, the investigations of which resulted in the opening of the mouth of the Mississippi River, which has done so much to build up the commerce of the West and South.

WILLIAM WINDOM.

In 1881 Mr. Windom resigned his seat in the Senate to accept the portfolio of the Treasury in President Garfield's cabinet, but with the termination of the tragedy of that summer by the death of the President he tendered his resignation to President Arthur, and it was accepted. As Secretary of the Treasury, although less than eight months in office, Mr. Windom had, by his broad and sound views and strong logic, achieved a high reputation as a financier, and the refunding scheme carried out by him shortly before his resignation ranks as a financial stroke with the resumption of specie payments in the preceding decade. Upon November 14, 1881, Mr. Windom resumed the seat in the Senate to which he had been re-elected to fill his own unexpired term. From the close of this term, however, he took no active part in public life until appointed Secretary of the Treasury for the second time, by President Harrison, passing most of his time in the mean while in New York, where his extensive business interests had centered. He was engaged in many important financial undertakings, having among other things extensive interests in mining lands in the Northwest and in Mexican railways.

The career of Secretary Windom while chief of the Treasury Department during the present administration is well known. He has been a firm friend of honest money and a stout bulwark of the integrity of the financial status of this nation.

Mr. Windom was not a statesman of the spectacular scale. He had no fondness for glitter, and relied alone upon the calm intelligence and good judgment of the people. He was a man of great popularity and universally respected. His qualities were aptly described by Dr. Hamlin, in his funeral address:

"A gentleman of charming affability, of unfailing courtesy, of quiet dignity, of beautiful refinement; a lawyer of wide reading and great talent; a legislator of unwearying industry and undaunted courage; a cabinet officer of broad views, of sound policy, of abundant aggressiveness, joined to safe conservatism; a man of unsullied integrity, a citizen of unflagging patriotism; a friend, a husband, a father, a Christian of sterling faith, of sincere humility, of unostentatious humility, such was William Windom."

QUANTITATIVE DETERMINATION OF ANTIMONY.

A scheme for the determination of antimony, by Marsh's method, described by A. Van Bylert, is thus given in the *Journal of the Society of Chemical Industry*. The method is adapted to the estimation of small quantities of antimony in antimony alloys. The alloy is dissolved in mercury, and to the solution sodium amalgam is added to form the sodium antimonide. This is then decomposed by means of dilute sulphuric acid. The apparatus necessary consists of a three-necked Woulff's bottle, one neck of which is connected with a carbon dioxide generator; through the middle neck passes a feed tube, which should be as wide as is compatible with the size of the neck, and the third neck has attached to it a calcium chloride tube and a piece of glass combustion tubing; 0·5 gram. of the alloy is dissolved in 20 c. c. of mercury by warming in a test tube to 60° C. After cooling, the amalgam is introduced into the Woulff's bottle and the central tube is made to dip under its surface. Through one of the side necks 100 c.c. of sulphuric acid (1 to 10) are added. The air is now displaced by carbon dioxide, the combustion tube heated to redness, and sodium amalgam (made by dissolving 5·5 grams. of sodium in 25 c.c. of mercury) added drop by drop down the central tube. The apparatus is carefully shaken, care being taken that no possibility of an escape from the central tube shall occur. When the evolution of gas has ceased, carbon dioxide is passed for some time, and then the heating of the tube is discontinued. Evolution of gas lasts usually about an hour. After this the supernatant liquid is removed and the mercurial solution is poured off and dried by filter paper. After the apparatus has been thoroughly cleansed and dried, one-half of the mercurial solution is reintroduced, with 75 c. c. of sulphuric acid (1 to 10); to the other half 3 grams of sodium are added and this mixture is then poured drop by drop through the central tube to the first half. The antimony from this second experiment is collected in a fresh tube; it should not exceed 1% of the total antimony. The weight of antimony is ascertained by weighing the tubes.

To prevent the possibility of a deposit of carbon near the heated portion of the tube, a current of hydrogen may be employed instead of carbon dioxide.

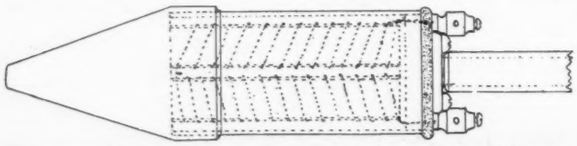
Construction of Accident Insurance.—A merchant who is insured under an accident insurance policy which provides that any member who is injured while engaged, temporarily or otherwise, in an occupation more hazardous than that in which he is insured, shall be paid as for the occupation in which he is injured and not as for that in which he was insured, may recover upon accidental injury while hunting, as a matter of recreation, the amount specified for a merchant and not the amount specified for a hunter. He cannot be said to be engaged at all in the "occupation" of hunting while hunting merely for sport. Where a mutual association wrongfully refuses to make an assignment, if it is shown that, had an assignment been made at the proper time, the full amount of policy would have been realized, it is proper to enter judgment for the full amount of the policy. *Union Mutual Accident Ass'n v. Prohard, Supreme Court of Illinois*, 25 *N. E. Rep.*, 642.

MINER'S ELECTRIC SOLDERING IRON.

Many applications of the electric current for heating purposes have been introduced, and one of the most recent and novel of these is the heating of soldering irons. A device of this kind, which is illustrated by the accompanying engraving, has been invented by Mr. William M. Miner, of Plainfield, N. J. Its advantages are obvious. With the electric current the iron can be maintained at a constant temperature, thereby saving the time and labor of heating in a gas flame or charcoal fire, avoiding the danger of these and making possible better work.

The soldering iron which we illustrate consists of the usual soldering head, having a cylindrical extension which contains two copper heating cores mounted upon a slate base. These cores are wound with No. 24 German-silver wire, which is heated by the electric current passing through it.

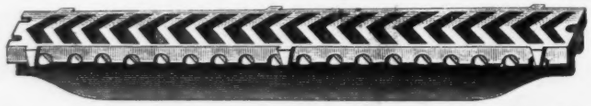
An iron of this kind is now being given a practical test at the works of



the Tidewater Oil Company, at Bayonne, N. J., at which 36,000 tin cans are manufactured daily. In the manufacture of the cans the soldering is done by machinery, which is practically automatic, but after filling with oil the opening is closed with a cap or faucet, which it is necessary to solder by hand. The electrical soldering iron has been used for this purpose, with excellent results, effecting a considerable saving in expense. From two to eight irons, depending upon their size, are operated with an expenditure of current equal to one horse power. These electrical soldering irons may be made of any size and shape desired, and the current may be taken from any sort of a circuit. The heating resistance, of course, may be of German silver, iron, or carbon. The latter, however, has certain advantages in the way of durability that may cause it to be adopted in manufacturing these irons on a larger scale.

ROGER'S SECTIONAL GRATE.

This grate, which is manufactured by the Argand Grate Bar Works, has been favorably known for some time. It is constructed so as to have a ventilating air space between the outer sides of the longitudinal supporting ribs and the circumscribing bands which connect the lateral ribs, or "V's." The longitudinal supporting ribs, under the web, are set in



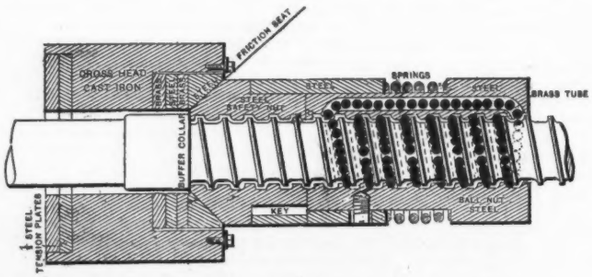
from its outer edges, so as to be equidistant from one another, thus allowing a free circulation of air. The grate is made strong and durable, and the large percentage of air space, evenly distributed, insures good combustion. With different air spaces the grate is adapted to burn various kinds of fuel, from lump and broken coal to pea, buckwheat, screenings, and many kinds of cheap and waste fuel. The construction of the grate is illustrated in our cut.

An Electrical Balance.—An ingenious electrical balance was recently exhibited in Paris. The object to be weighed was placed in the pan, by which act an electric circuit was closed and a motor put in operation which moved the weight out on the beam of the balance. When the equipoise was established the circuit was broken. Upon emptying the pan the weight returned.

Determination of Zinc in Iron Ores.—Rose Finkener gives in *Chemical News* the following method for this determination: Five grams of the ore are dissolved in strong hydrocloric acid. From 2 to 3 c. c. of strong nitric acid are added to the solution, which is evaporated to dryness and filtered. Into the filtrate, which is heated to from 80° to 100° and strongly acidified, sulphureted hydrogen is introduced in order to eliminate any copper, arsenic or antimony which may be present, to convert ferric into ferrous chloride, and to saturate the solution 200 c. c. at least) with sulphureted hydrogen. If copper is to be determined, and if a precipitate has appeared, it is filtered off along with the liberated sulphur. In the contrary case the filtration is omitted, acetic acid and ammonium acetate are added, and ammonia is added from a burette, the delivery tube of which is immersed in the liquid. It is run in at first in large quantities and then drop by drop, keeping the vessel in motion until the precipitate, consisting of zinc sulphide and a little iron sulphide, has taken a gray color. If the gray color no longer disappears after the glass has been briskly shaken dilute hydrochloric acid (1:50) is dropped in until it turns white, and dilute ammonia is then again cautiously added until a permanent light gray color is obtained. On the completion of the precipitation the zinc sulphide coagulates and begins to subside. It is then filtered and washed with water containing acetic acid and sulphureted hydrogen. The filtrate should be tested as follows: The filter with its contents is placed in a beaker, a sufficient quantity of dilute hydrochloric acid (1:6) is added, the mixture is stirred, filtered and washed, if copper sulphide is present, with water containing hydrochloric acid and sulphureted hydrogen. If cobalt or nickel is present the sulphides of these metals remain undissolved. The sulphureted hydrogen is expelled from the filtrate by heat, the liquid is let cool, mixed with a slight excess of sodium carbonate, heated to a boil, filtered, and the precipitate of basic zinc carbonate so obtained is dried and ignited. If the precipitate of copper sulphide obtained in the acid solution by means of sulphureted hydrogen is filtered off, and if the zinc sulphide thus obtained is free from cobalt and nickel sulphides (which is generally the case), it is ignited with powdered sulphur in a current of hydrogen and weighed as zinc sulphide.

LIEB'S ANTI-FRICTION SCREW.

An ingenious application of the ball-bearing principle for the purpose of overcoming the excessive friction of screws has been devised by Mr. Charles A. Lieb, of the Lieb Machine Works, 23 Vandewater street, New York. A great objection to the use of screw gearing has been the enormous friction of powerful screws in the nuts, which are necessarily massive. As will be seen from our illustration, Mr. Lieb's device consists in placing small balls of hardened steel, such as are used in other types of anti-friction bearings, between the threads of the screw and those of the



nut. From one end of the nut to the other a longitudinal passage is provided in order that the balls may complete their circuit. These, of course, reduce the friction in a very marked degree.

This principle is being applied to an electric screw elevator, now in course of construction at the works of Bergman & Co., in this city. Our cut, in addition to the anti-friction nut, shows the safety nut, which is not ordinarily in use.

This principle is, of course, applicable to screws used for many other purposes, as, for instance, jack screws and worm gears. In the case of the latter the ball bearings are set in grooves in the face of the teeth of the worm wheel between which the screw turns.

A New Method for Testing the Hardness of Metals.—C. A. Caspersson, Argretshill, Sweden, has recently obtained a patent for a method of testing the hardness of iron and steel while in process of manufacture. The inventor conducts a current of electricity through a test piece of iron or steel, melting the same, upon which the strength of the current necessitated in the operation is compared with the strength of current required for the fusion of a standard piece of metal of determined degree of hardness, and of the same diameter as the piece to be tested. The hardest piece will resist longest, but melt if the current be maintained sufficiently long. It is thereby easy to ascertain the hardness of any metal treated, through the number of ampères required in its fusion.

The Formation of Petroleum.—Engler's researches, says A. Veith, in *Chem. Zeit.* 14, 1368, have shown that petroleum is of animal origin. It is formed by the decomposition of marine animals, the nitrogenous organic matters being decomposed with evolution of ammonia, and the fats, under the influence of heat and pressure, into glycerol and fatty acids; the first is washed away, and the latter are further decomposed with formation of hydrocarbons and water. Engler considers the production of carbon dioxide and carbon monoxide in the conversion of fish oil into petroleum to be the result of a secondary reaction, as these bodies occur only in very small quantities in petroleum, and the less of these gases that is formed the more regularly is the reaction considered to proceed. Engler's experiments can also be explained in another way. The conversion of fats into hydrocarbons may be brought about as follows: The fat is first decomposed into glycerol and fatty acid. The glycerol is then converted under the influence of heat and pressure into acrolein, and by the elimination of water and condensation this is converted into benzine, while the fatty acids under the same conditions are converted into hydrocarbons and carbon dioxide. The carbon dioxide under the influence of dissociated hydrocarbons is reduced to carbon monoxide, and ultimately to volatile hydrocarbons. The author thus considers that when gaseous hydrocarbons are found associated with petroleum they are formed from carbon dioxide as above; when they are absent he considers that the carbon dioxide has been absorbed by basic earths, with production of carbonates.

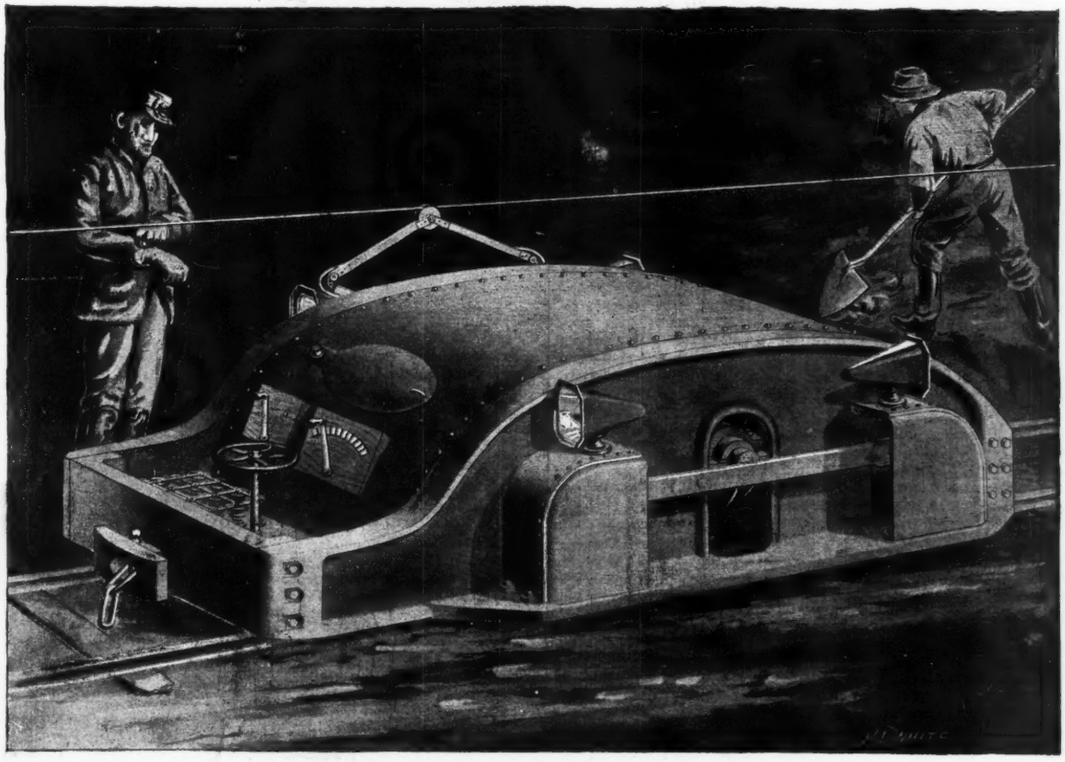
Explosions in British Mines in 1890.—No fewer than 285 lives were lost by explosions of gas in the coal mines of Great Britain in 1890, according to *Iron*, and nearly all of these took place during the first six months. Of the total deaths 273 occurred in the South Wales mining district, and in nearly every instance resulted from the use of naked lights or from blasting. The first fatal explosion took place in January at the Glyn colliery, near Pontypool, when five workmen were killed by a naked light igniting the gas. On February 6th, 176 lives were lost at the Llanerch colliery, near Newport, Monmouthshire, where the operations were carried on with naked lights. At the Morfa colliery, near Aberavon, Glamorganshire, on March 10th, there was an explosion resulting in the loss of eighty-seven lives. Two lives were lost in the discharging of new explosives, and two men were killed at the Abernant colliery, near Aberdare, in May, by a light igniting an explosive mixture. In the second half of the year the deaths from explosions in mines were comparatively few. The first took place in September, when one miner was killed at the Butterworth colliery, near Rochdale, while carrying a naked light. In the same month two men were killed at the Hepburn colliery, near Newcastle, by the ignition of a quantity of gas, and a lad at the Snab Pit, Bowness, Scotland, was unable to escape with others on the occasion of an explosion, and was only reached three days after. The last explosion of the year took place on December 8th, at Abertillery, Monmouthshire, in the sinking of a shaft, when three men were killed, owing to some shots fired by electricity not going off altogether as was expected.

THE THOMSON-VAN DEPOELE ELECTRIC MINING LOCOMOTIVE.

The Thomson-Van Depoele Electric Mining Company, of Boston, has devised a new type of electric mining locomotive for underground work, shown in the accompanying illustration, which the company is now prepared to furnish in several sizes.

The signal success of the mine haulage installations which have already been made has demonstrated the position which electricity is to occupy in this field of work. The Thomson-Van Depoele machine shown in the cut is of 60 horse-power capacity and has a total height of 39 inches from top of rails. It is built to operate on tracks of varying gauge from 36 inches to the standard 4 feet 8½ inches.

The controlling devices are all placed at one end, and, the body of the locomotive being so low that the view is unobstructed in either direction, the operator need not change his position in reversing the motion of the locomotive. Two electric parabolic reflectors are provided at each end, making the track clearly visible for long distances. The trolley is of the double elbow pattern, which has been found so admirably suited to mine work in previous installations. It accommodates itself to the varying heights of the trolley wire within any reasonable range. The sheet-iron coverings make a completely water-tight armor, protecting the moving parts from danger of falling rocks and other accidents. The illustration



THOMSON-VAN DEPOELE ELECTRIC MINING LOCOMOTIVE.

shows the locomotive in an enlarged chamber, but about to enter a drift, whose height from top of rail is scarcely four feet, hence the depression of the trolley wire as shown.

THE ORE DEPOSITS OF PIOCHE, NEVADA.

The following is an abstract of a report made by George W. Maynard upon the property of the Pioche Consolidated Mining and Reduction Company. Pioche is situated in the Ely mining district, Lincoln County, Nev. It is reached by a branch of the Union Pacific Railway from Salt Lake City to Milford, and thence by wagon a distance of 115 miles. An extension of the railway is now in course of construction to Pioche, however.

The mines of Pioche were discovered in 1864 and were worked up to 1880. Their production during that time is estimated in round numbers to have been $20,000,000.

The Raymond and Ely and Meadow Valley mines, which are the principal ones of the district, produced from 1871 to 1879, as shown in their annual reports, $15,093,735.68; there were also 302 car loads of concentrates from mill tailings smelted at Bullionville, 12 miles from Pioche, producing base bullion to the value of $670,048.35; while the Raymond and Ely, Meadow Valley, Mazeppa, Creole, Alps, Newark, Yuba, and other mines are estimated to have produced $4,236,211.97 prior to 1871. The reported dividends paid were between $4,500,000 and $6,000,000, the comparatively small percentage, in relation to the gross product, being due to the necessarily high cost of working, on account of distance from supplies, and high wages, together with extravagant and in some instances unminerlike management. In 1880 the mines, while still in bonanza, were closed, the rivalry between the officials of the two companies then operating being given as the reason for this proceeding. The workings of the Raymond and Ely and Meadow Valley companies were connected, so that the pump of the former drained the latter. The Meadow Valley, however, had already begun to provide a pumping plant when the Raymond and Ely pump was stopped and the lower levels were flooded. The workings in this property were down 1,500 feet and the water level was at 1,200 feet.

With increase in depth the ores had become more and more unfitted for treatment by the milling process then in use at Bullionville, and immense quantities of ore were run through the mills which should have been otherwise treated, as is shown by the high value of the tailings at Bullionville, from which a large amount has already been recovered by smelting.

The country rock at Pioche is quartzite, the strata having a very uniform dip of about 18° to 20°, except where thrown or faulted by dikes of porphyry. There is one great dike which measures from 25 to 35 feet on the surface, and from 60 to 70 feet in the lower workings. The great lodes of the district are contiguous to this dike. The veins have a general east and west course, with a south dip from 50° to 80°, and are practically perpendicular to the dip of the quartzite. The great main fissures are easily followed, and as a rule have well-defined walls or partings between the vein filling and country rock. Where the vein is entirely in porphyry, as in the case of the middle vein of the Yuba mine, the vein mass is a decomposed or kaolinized porphyry; at the contact between the quartzite and porphyry it becomes more silicious, and, when entirely in quartzite, silica predominates. One of the marked characteristics of the district is the occurrence of hydrous oxides of iron and manganese, frequently forming almost the entire vein filling, as is the case in the Zero mine.

In general the lead ores, oxide, carbonate, and phosphates are the silver carriers, the original ore having been galena, which is found in large masses above the water level, where the oxidizing influences have been less strong. Large bodies of oxidized ore are found as low as the 1,100 and 1,200 feet levels. Zincblende occurs in increasing amount with depth and when present in large quantities the vein mass is not rich in silver.

The various silver sulphurets and occasionally horn silver are found through the veins with small amounts of lead or none at all. It is this class of ore which was sought as milling ore in the early days in the district, the sulphide ores being left standing as far as possible.

About eight miles from Pioche is situated the Half Moon group of mines. At this place the country rock is limestone, the ore being found between strata of limestone and shale. Limestone of an average thickness of 2½ feet always lies above the ore, and this is capped by a stratum of shale from a few feet to 50 feet in thickness. Another stratum of shale always underlies the vein of ore; the latter is nearly horizontal, varying in thickness from 12 inches to 18 inches in thickness, occasionally swelling, however, to twice that amount. The ore is lead carbonate, oxide and phosphate, with quartz as gangue. The Hamburg and Mendah mines, 10 miles from Pioche, are fissures entirely in limestone.

One of the most important sections of the Pioche district is Jack Rabbit camp, re-christened Royal City, 16 miles southwest of Pioche, at which is located the Day mine, which is the most extensively developed of the camp. The geological formation at Jack Rabbit is lower silurian limestone, the strata dipping 18° to 20° northeast. The Day fissure cuts this at an angle of about 70°. Beneath the limestone is the quartzite, which is seen outcropping on the opposite side of the range. The Day fissure is of extraordinary width, measuring in places as much as 130 feet. The vein filling, where not ore-bearing, is crystalline calcite, and in the ore-bearing portions calcite and oxides of manganese and iron. Through the vein mass run bodies of lead carbonate and oxide, varying from a few inches to many feet in width, which are invariably rich in silver. The

Onondaga vein, which is parallel to the Day, differs from it in the almost regular distribution of these bodies of lead carbonate and oxide through the vein mass.

The Pioche Consolidated Mining and Reduction Company has been smelting these ores at its furnace at Pioche. The iron ore for flux is obtained from mines about 11 miles distant, which have opened a deposit of ore assaying 54% iron and 8% to 10% silica. The cost of smelting at Pioche, in the single furnace of 50 tons per day capacity, is stated at $8.16 per ton burden, or $9.38 per ton of ore—very low figures, considering that coke costs $35 per ton, and that other expenses are in proportion. The extraordinary occurrence of ores necessary for lead smelting in this district, however, makes it possible for the company to obtain good results in its furnace; and the cost will undoubtedly be much reduced with the completion of the railway.

The average value of the ores mined in the Pioche district, as given by Mr. Maynard, is of interest. From the Yuba mine, 711 tons of ore smelted during 1890 averaged 33·5% lead, 51·88 ounces silver, and 0·196 ounces gold; 1,330 tons from the Half Moon group averaged 17·08% lead 18·71 ounces silver, and 0·452 ounces gold; 420 tons from the Day mine averaged 6% lead and 33·91 ounces silver; and 431 tons from the Onondaga, 2·09% lead and 30·6 ounces silver. The estimated ore reserves in the various mines which compose the property of the Pioche Consolidated Mining and Reduction Company are reported by Mr. Maynard to be very large; and the company, which is a consolidation of some of the old interests, is taking steps to revive the mining industry of the district upon an extensive scale.

SULPHUR IN BESSEMER STEEL.

By John W. Cabot, Bellaire, O.

In the manufacture by the Bessemer process of soft steel suitable for rolling into fine sheets, tubes and so forth, a difficulty is sometimes met with in the tendency of this kind of metal to rise violently and boil in the molds while being cast; this results in hollow-topped ingots, and consequently in an undue amount of scrap in the subsequent rolling. It has been noticed that this peculiarity does not pertain to all pig irons, some grades producing a blown metal which pours quietly, while others, in whatever way the blow may have been conducted, give a metal which rises in the molds, accompanied by the evolution of large quantities of hydrogen and carbonic oxide gases, and requiring a long time to solidify. This difference in behavior has been somewhat difficult to understand. We were at first inclined to look to the element manganese for the explanation, because of the well-known part which it plays in the reactions between the oxygen of the blast and the other elements, particularly carbon. The higher manganese irons generally gave a characteristic rising metal, but the manganese theory was abandoned when it was found that pig irons of lower manganese-content sometimes worked in the same way.

While blowing soft steel at Bellaire from metal taken directly from the blast furnace, we made some observations which seemed to offer an explanation of this difference in the behavior of different grades of iron.

As the direct iron has less sulphur than the same iron when remelted in the cupola, owing to the absorption of that element from the coke in the remelting, we were able to produce from it steel very low in sulphur. Now, this unusually low-sulphur metal showed the rising tendency in a most marked degree; when, however, the metal from the furnace contained an increased percentage of sulphur, this excessive evolution of gases did not take place, and the casting of the ingots was accomplished in the normal manner.

Some analyses are here given of a number of blows varying in their carbon and manganese content, which were of this character of rising steel; and for comparison, a second series which worked quietly. The rising steel analyzed as follows:

C.	Mn.	S.	Si.	C.	Mn.	S.	Si.
0·08	0·32	0·033	0·009	0·09	0·38	0·032	.....
0·08	0·33	0·034	....	0·08	0·35	0·035	.....
0·10	0·28	0·033	....	0·09	0·38	0·032	.....
0·10	0·34	0·035	....	0·08	0·35	0·035	.....
0·09	0·38	0·031	....	0·10	0·44	0·030	.....
0·09	0·30	0·035	....	0·10	0·42	0·030	.....
0·09	0·35	0·028	0·009	0·08	0·20	0·030	.....
0·09	0·40	0·036	....	0·08	0·34	0·036	.....
0·08	0·30	0·035	....	0·09	0·37	0·036	.....
0·08	0·40	0·038	....	0·08	0·33	0·035	.....
0·08	0·25	0·035	....	0·10	0·42	0·035	.....
0·10	0·44	0·039	....	0·10	0·44	0·032	.....
0·10	0·40	0·025	....	0·08	0·22	0·035	.....
0·09	0·38	0·025	....	0·08	0·40	0·030	.....
0·10	0·41	0·020	....	0·08	0·33	0·035	.....
0·08	0·35	0·035	....	0·10	0·41	0·020	.....
0·11	0·48	0·028	....	0·08	0·35	0·030	.....
0·10	0·45	0·025	....	0·08	0·33	0·028	.....
0·08	0·35	0·035	....	0·09	0·28	0·032	.....

The normal-working steel is represented by the following:

C.	Mn.	S.	Si.	C.	Mn.	S.	Si.
0·08	0·45	0·069	....	0·08	0·44	0·050	.....
0·08	0·32	0·057	....	0·10	0·44	0·050	.....
0·08	0·30	0·049	....	0·09	0·42	0·048	.....
0·08	0·28	0·048	....	0·11	0·46	0·054	.....
0·08	0·28	0·084	0·009	0·09	0·38	0·060	.....
0·00	0·33	0·053	....	0·08	0·38	0·075	.....
0·08	0·25	0·065	....	0·09	0·42	0·072	.....
0·08	0·38	0·050	....	0·08	0·28	0·057	.....
0·08	0·35	0·068	....	0·08	0·30	0·058	.....
0·08	0·27	0·064	....	0·09	0·40	0·078	.....
0·08	0·35	0·064	0·009	0·08	0·40	0·057	.....
0·08	0·32	0·046	....	0·08	0·35	0·055	.....
0·08	0·32	0·068	....	0·08	0·35	0·055	.....
0·10	0·44	0·050	....	0·08	0·33	0·060	.....
0·09	0·38	0·048	....	0·08	0·35	0·055	.....
0·08	0·38	0·050	....	0·09	0·42	0·045	.....
0·08	0·35	0·072	....	0·08	0·33	0·046	.....
0·08	0·42	0·068	....	0·09	0·45	0·065	.....
0·09	0·52	0·070	....	0·09	0·43	0·070	.....
0·08	0·42	0·080	....	0·09	0·42	0·045	.....

It will be noticed that the only essential difference in the two series is in the amounts of sulphur present. It is unusually low in the rising steel, and of about the amount common in cupola metal in the case of the tests which worked normally, the average analysis being for the rising steel,

C = 0·09 M = 0·36 Si = 0·009 S = 0·03

and for the quiet metal,

C, 0·084 Mn, 0·39 Si, 0·009 S, 0·058.

It is well known that sulphur exerts a potent influence upon the condition in which carbon exists in combination with iron in pig metal. A few hundredths of one per cent. are sufficient to throw a large portion of it into the combined form in an iron which would otherwise be graphitic. Now, in the case of the heats blown from the high-sulphur metal, the sulphur probably acted in the same way in forcing the carbon of the metallic bath into combination (in which condition only is it readily attacked by the oxygen of the blast), the line of separation between complete carbon-oxidation and the beginning of iron-oxidation being thus more sharply defined, and the carbon thoroughly washed out before the iron was attacked. This supposition was borne out by the character of the change in the flame, which was quick and decided.

In order to determine the correctness of this view we added to the blows of the low-sulphur iron enough more sulphur to increase the ·01% and ·02% originally present to ·05% and ·06%, and in every case the troublesome evolution of gas from the metal was prevented and the steel poured quickly. In whatever way the extra hundredths were added, whether by adding coal or shale to the heats, or by mixing with them a high-sulphur pig iron, the effect was the same.

No doubt the peculiarity of low-sulphur steel can be overcome by mechanical means, such as stirring or by the method of repouring. The presence, however, of ·04% or ·05% of sulphur seems to have a favorable influence on the reactions taking place between the oxygen of the blast and the elements in the pig metal, in producing this description of material.

* A paper read before the American Institute of Mining Engineers, September 1890.

Banca and Billeton Tin.—The shipments of tin from these islands off the coast of Java, and from which the Netherlands India derive a considerable income, exceeded 9,000 tons last year, says the *Indian Engineer*. The production of Banca showed a falling off, however, as compared with previous years.

Fluorides as Agents for Softening Hard Water.—Dr. Doremus has recently found that sodium fluoride and other fluorides can be used with advantage for softening hard waters. He finds that the precipitation of magnesium is especially thorough, and that this reagent does not present any of the serious difficulties that are met with in the practical use of lime, soda ash, and caustic soda.

Remarkable Railway Speed.—Charles Watts, Superintendent of the Chicago division of the Pittsburg, Fort Wayne & Chicago road, claims that the fastest time ever made on an American railway was on that road lately. His official report showed that this special train ran 53 miles in 45 minutes, 11 miles of which were covered in seven minutes, or at an average speed of 94 miles an hour. The train sheets show that the above statement is correct.

Export Duty on Spanish Iron and Copper Ores.—At a recent meeting of the Spanish Government Tariff Commission it was approved, by 13 votes against 8, to recommend the government to put an export duty of 5% *ad valorem* on all iron and copper ores sent out of Spain. To prevent this heavy new tax becoming law, the Miners' Club in Bilbao (composed of all the important mine owners, merchants, and exporters) has taken up the question. There already exists a 1% tax on all minerals extracted from iron-ore mines in the country. It is based on the value of the ore at the mine.

DIVIDENDS PAID BY MINING COMPANIES DURING JANUARY AND FROM JANUARY 1ST, 1891.

Name of Company.	Paid in Jan.	Paid since Jan. 1st.	Name of Company.	Paid in Jan.	Paid since Jan. 1st.
Aspen, Colo.	$20,000	$20,000	Granite Mountain, Mont	$200,000	$200,000
Bald Butte, Mont.	10,000	10,000	Homestake	12,500	12,500
Banister, Mont.	6,000	6,000	Idaho, Cal.	6,200	6,200
Bimetallic, Mont.	70,000	70,000	Jackson, Nev.	5,000	5,000
Calliope, Colo.	5,000	5,000	Little Rule, Colo.	10,000	10,000
Calumet & Hecla, Mich	500,000	500,000	Mammoth, Utah	40,000	40,000
Centennial-Eureka, Utah	15,000	15,000	May Mazeppa, Colo.	12,500	12,500
Champion, Cal.	10,000	10,000	Montana Ltd., Mont.	39,600	39,600
Daly, Utah	37,500	37,500	Napa, Cal.	10,000	10,000
			Ontario, Utah	75,000	75,000

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent Office:

TUESDAY, FEBRUARY 3D, 1891.

445,589. Sheet Metal Folding Machine. Charles R. Peaslee, Louisville, Ky.

445,601, 445,602. Pneumatic Motor. Francis H. Richards, Hartford, Conn., Assignor to Eckley B. Coxe, Drifton, Pa.

445,644. Stone Dressing Machine. Joseph Kellow. Brooklyn, N. Y.

445,679, 445,680. Roller Bearing. Charles D. Meneely, Albany, N. Y.

445,691. Process of and Apparatus for Producing Hot-Rolled Copper Free from Oxidation. George W. Dummins, Vienna, N. J., Assignor, by mesne assignments, of one-half to Margaret A Coleman, New York.

445,770, 445,771. Method of Electric Soldering and Cementing Cans. Mark W. Dewey, Syracuse, N. Y., Assignor to the Dewey Corporation, same place.

445,818. Sheave. Thomas O'Neill, San Francisco, Cal.

445,831. Steam Injector. John Desmond, Bridgeport, Conn., Assignor to the Hayden & Derby Manufacturing Company, New York.

445,850. Bell and Hopper for Blast Furnaces. Benjamin F. Conner, Columbia, Pa.

445,862. Dredger. Hugo Roessler, Erbach-on-the-Rhine, Germany.

445,874. Machine for Die Rolling Metals. William P. Bettendorf and Joseph W. Bettendorf, Davenport, Ia.

445,886. Surveying Instrument. Joshua N. Gee, Pleasant Grove, Va.

445,899. Air Brake. Frank Lansberg, St. Louis, Mo., Assignor to the Lansberg Brake Company, same place.

445,934. Feed-Water Heater and Purifier. Virgil H. McConnell, Buffalo, N. Y.

445,962. Pump. James P. Montgomery, South Pueblo, Assignor of seven-eighths to Lewis L. Marble, William C. Marymee and John C. Settle, all of Pueblo, Colo.

445,963. Triple Valve for Automatic Brake Mechanisms. Frank Moore, Pittsburg, Assignor to the Westinghouse Air-Brake Company, same place.

445,965. Mechanism for Coiling Wire Rods. Fred H. Daniels, Worcester, Mass.

PERSONALS.

Mr. Thos. Bailey, who for many years has been the agent of the Athens Iron Foundry, of Tennessee, has resigned his position.

Mr. James E. Mills, of San Francisco, will deliver a lecture on the Sierra Nevada before the American Geographical Society in Chickering Hall, New York, on next Monday evening.

Mr. S. P. Ely has resigned the presidency of the Republic Iron Mining Company, of Marquette County, Mich., owing to the fact that rapidly developing Cuban iron mining interests demand his attention.

Mr. William Morris, for some time superintendent of one of the departments of the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa., has been made general superintendent of the plant of the Allegheny Bessemer Steel Works, at Duquesne, Pa.

Dr. A. R. Ledoux, the well-known chemist of this city, will, on Monday night, address the New York Academy of Sciences, in Hamilton Hall, Columbia College, by request, on "Some Notes on the Sweet Grass Hills, Montana, and the Kootenai Mining District of British Columbia."

Supt. Frank P. Mills, of the Cleveland mine, has been appointed superintendent of the mines operated by the Iron Cliffs Company. Mr. Mills remains in charge of the Cleveland mine. His appointment will not affect the positions of other official engaged with the Iron Cliffs Company.

Mr. Charles Butters, mining engineer and metallurgist, and owner of the Butters' Ore Milling Works, of Kennet, Cal., passed through this city this week with his family on his way to Transvaal, Africa, where he goes to erect chlorination works in the interest of English capitalists. He will be absent about a year.

Mr. L. L. Skinner has resigned as superintendent of the Caledonia Mining Company, of Terraville, Dak., and Mr. Richard Blackstone has been appointed. He will take charge of that property, together with the Father De Smet Mining Company and the Black Hills & Fort Pierre Railroad. It is rumored that he will shortly resign his position as superintendent of the railroad.

Prof. Theodore W. Dwight, warden of the law school of Columbia College, New York, has presented his resignation, to take effect July 1st, and the same has been accepted by the trustees. Professor Dwight will be made professor emeritus, on half his present salary, under the rules of the college adopted in December. The trustees adopted resolutions acknowledging Professor Dwight's service to the institution, and requesting him to sit for a portrait to be placed in the college library.

Mr. Thomas H. Phillips, general manager of the Lehigh and Wilkesbarre Coal Company collieries, of Pennsylvania, recently tendered his resignation, to take effect February 1st. His chief reason for the step was the health of his wife and children. Mr. Phillips expects to remove his family to Philadelphia, and in the mean time will give some attention to private business affairs in other sections of the State, and will then take a prolonged Western trip, combining pleasure with business. No successor as general manager will be appointed for the present, but the duties of that office will devolve upon Mr. Elmer H. Lawall, who is given full powers.

The Commission recently appointed by President Harrison for the purpose of testing the coins made during the year will meet at the Philadelphia mint on the 11th inst. The Commission includes Hon. Nelson W. Aldrich, committee on finance, United States Senate; Hon. Thomas H. Carter, committee on coinage, weights and measures, House of Representatives; Dr. B. A. Gould, Cambridge, Mass.; Cabell Whitehead, assayer, Virginia; Nelson F. Evans, Philadelphia; Frank A. Leach, Oakland, Cal.; G. R. Mitten, Helena, Mont.; Prof. John H. Appleton, Providence, R. I.; C. W. Moore, Boise City, Idaho; E. S. Wilcox, Peoria, Ill.; Irwin Sheppard, Winona, Minn.; H. W. Cannon, New York; Charles Parsons, St. Louis; J. M. Bailey, Jr., Sioux Falls, S. D.; W. D. Ewing, Evansville, Ind.; Charles W. Parrey, Springfield, Ill. The other members of the Commission are the Judge of the District Court for the Eastern District of Pennsylvania, the Comptroller of the Currency, and the Assayer of the Assay Office, New York. These latter are *ex-officio* members of the Commission.

OBITUARY.

Dr. Gustav Natorp, editor of *Gluckauf*, died on the 12th ult. He was closely connected with the mining interests of the Dortmund district, Germany, and contributed greatly in various ways to their development.

Gen. Charles B. Norton died in Chicago, Ill., on the 29th ult., aged 66 years. He made a thorough study of international expositions, and was universally regarded as an authority on matters appertaining thereto. He was a government agent to the London Exposition of 1851 and American Commissioner to the Paris Exposition of 1868. He was intimately associated with the management of the Philadelphia Centennial of 1876, and recently went to Chicago as an advisory aid to Director-General Davis, who intended to appoint him historian.

SOCIETIES.

The fourth annual convention of the Pattern Workers' League met in Chicago, Ill., on the 1st inst. At this meeting initiatory steps were taken in the federation of the national societies of the machinists, moulders, pattern makers and brass workers—the four branches of the iron-working trade.

At the meetings of the Verein Deutscher Eisenhuttenleute, held on the 21st ult. and the 11th inst., which were attended by some 500 members, papers were read on the American trip of last October. Mr. Thielen, Mr. Brauns and Mr. Schrödter gave general *résumés* of the Southern, the Northern, and the Canadian trips, while Mr. Schlink and Mr. Schilling discussed the American blast furnace practice. Mr. Spannagel read a paper on "Rolling Mills," Mr. R. M. Daelen on "Steel Making," Mr. E. Klein on "Engineering Appliances," and Mr. Macco on "American Railway Practice." There was a very good discussion, in which Dr. Wedding took part.

ITEMS FOR EXPORTERS.

It is reported that several of the wealthiest planters at Cienfuegos, Cuba, have agreed to offer a reward of $1,000 in gold to the inventor of the best apparatus to load the cut cane from the field upon the cars which are to carry it to the sugar houses.

A special declaration to the government at Washington, formulated by the Congo State authorities, was signed on the 25th ult. It gives assurance that American imports will meet with "most-favored-nation" treatment on entering the Congo State.

The British Minister at Buenos Ayres, Francis J. Pakenham, has informed the Foreign Office in London that heavy taxes in the shape of licenses have been imposed upon foreign companies doing business in the Argentine Republic. Only companies which hold concessions from the Argentine government are excepted from the new tax.

Mr. H. Evan Ysendyk, Jr., proprietor of the largest coffee-house in Rotterdam, Holland, recently made a tour of the United States to inspect American coffee-roasting machinery. In recognition of its superiority to European make he has ordered from the Hungerford Company, New York City, all the machinery to be used in his new mills in Rotterdam.

A dispatch from Montevideo states that the Government of Uruguay has introduced a bill in the Chamber of Deputies raising the duties on spirits, sugar, perfumery, silks, tinned provisions and tobacco. The Customs Committee of the French Chamber of Deputies has agreed upon a general tariff of 80 francs on beet-root seed, the minimum being 60 francs, and a tariff of 40 francs per 100 kilos on foreign beet-root.

A trial of seed sowers will be held at an exhibition at Foggia, Italy, on October 20th, next. The Italian government offers two silver medals, a diploma of honor (accompanied by the purchase of five of the winning sowers) to the best machine, a purse of $38.60, and ten prizes of $5.79 each to the next best machines. Requests for admission to the competition must be sent to the Committee of Direction before September 15th.

The Cleveland Shipbuilding Company, of Cleveland, O., has received an order for two boilers 11 feet in diameter by 10 feet 6 inches in length for the ocean steamship "Kinau" now lying at Honolulu, Sandwich Islands. The boilers will be completed at the boiler shop department of the Cleveland Shipbuilding Company, then taken apart and shipped in plate form with rivets, flues, etc., all complete for putting together in the steamer. The Continental Iron Works, of Brooklyn, N. Y., furnish the corrugated flues for these boilers.

The government of New South Wales has recently ordered 27 American locomotives, for use on a new railroad in that colony, from a Philadelphia firm. The order is based on the advantage of American-built locomotives for climbing heavy grades and turning sharp curves. The freight locomotives are of the heaviest and strongest build, and, with tender attached, will each weigh from 80 to 85 tons, and will be sold for about $10,000 apiece. A special steamer will be ready to take the engines out when complete.

The latest novelty in ocean freights is the transportation of molasses in bulk, tank steamers being used for this purpose such as have been employed in the petroleum trade. It is reported that two steamers of this character have been chartered to carry molasses in bulk from Cuba to the United States at 14s. per ton, which is extremely low, as according to the ship brokers it will result in a saving to the cargo owner of at least 50 per cent. There will be no expense for cooperage and dunnage, and stevedores' fee will be done away with, along with a host of incidental expenses.

A number of Canadian capitalists have organized the Canadian, West Indian and South American Steamship Company, and are to receive a subsidy from the Dominion Government of $50,000 a year. On the first trip many Canadian merchants were invited as the company's guests, free, for the purpose of establishing and stimulating trade exchange between St. John's, N. B., and Demerara, Bermuda, St. Kitt's, Antigua, Guadaloupe, Martinique, St. Lucia, Barbadoes and Trinidad. Consul Chester E. Jackson, of Antigua, writes of this fact in a vein which is not calculated to cheer American exporters of fish and lumber.

An international exhibition of manufactured articles as well as raw materials was opened in Moscow about a month ago, under the auspices of a company that has been organized for the purpose of promoting commerce between Russia and other nations. An engineer, Mons. M. Malkiel, is one of the most active leaders of the corporation. The exhibition is to be permanent. Entrance is free, and tasteful arrangement as well as various attractions emphasize the recognition, on the part of the committee, that the success of the enterprise depends on the kindness with which the general public takes to the idea.

The gold alone in Mashona land will develop Zambezia into, perhaps, the richest acquisition of the empire, said Mr. E. A. Maund in an address at the London Chamber of Commerce, recently, and there will be a rush to the new colony unexampled in the British history of South Africa. It is chiefly on account of its great richness in gold that we must look for the commercial value of Zambezia. The climate of the country is good, and its soil fertile. There will be a ready sale to natives of cotton goods, colored beads, trade knives, guns, powder and lead, axes, American plows, and corrugated iron houses.

American goods exported to China will hereafter be paid for in Chinese silver coins. The first silver coinage of China is now being ushered into the world. Around the open ports the Mexican and Japanese dollar and the subsidiary Japanese coins, as well as those from the old Hong Kong mint, have been current. The new coinage will be equivalent to the dollar, bearing on the obverse a curled dragon, and on the reverse the following inscription: "Current coin of Kwang-hsu," and "Minted at Canton." Orders are, therefore, given that from the issue of this announcement the Canton coins are to be taken at their standard value. Their price is not to be lowered. They are not to be refused as strange. Let all know that a heavy punishment will be dealt to those who impede their circulation.

The large buildings comprise three departments: for machinery, for industrial products and for pamphlets, price lists, etc. Foreign manufacturers and merchants send goods to be sold there or to serve as samples from which to order; the company attends to all the details and exacts a certain small percentage for rent, help, light, etc. The company, which has a technical and a commercial branch besides the financial and ordinary business departments, gives advice concerning appearance, packing, material, etc., of articles to be introduced in the Russian market and sends even, when feasible, samples of similar goods that have obtained favor there. Toys, tools, machinery, oysters, lobsters and dried codfish are mentioned as very apt to find a ready sale; it must, however, be borne in mind, that only first class goods can be disposed of in Russia. Mr. Schwartzkopff and the Danish consul, Mr. Thor. Lange, have shown a great deal of energy in establishing commercial relations between the society named and the Danish exporters. The American consul, it is to be hoped, will emulate those gentlemen in pushing American interests. The address of the exhibition and commission company is, in French: Exposition Internationale Permanente, Moscou, Russia, and in German: Internationale Permanente Ausstellung, Moskov, Russia.

In pursuance of the recommendations of the International American Conference, the Bureau of the American Republics has been established at Washington. The object of this bureau is the dissemination of authentic and usefu information concerning the commercial conditions and advantages of the several American republics for the benefit of manufacturers, merchants and others who may be interested in the extension of trade.

It is proposed to issue at frequent intervals, for free distribution to the public, printed pamphlets or bulletins containing:

First.—The existing customs tariffs of the several countries and all changes of the same as they occur, with such explanations as may be deemed useful.

Second.—Official regulations which affect the entrance and clearance of vessels and importation and exportation of merchandise at the ports of the several countries; also, circulars of instruction which relate to customs procedure or to the classification and appraisement of merchandise.

Third.—Ample quotations from commercial and parcel-post treaties between any of the American republics.

Fourth.—Important statistics of commerce and other information of special interest.

The bureau, it is announced, will at all times be available as a medium of communication and cor-

respondence to persons applying for reasonable information pertaining to the customs tariffs and regulations, and to the commerce and navigation of the American republics; and any suggestions as to the character of information that may be found useful will receive careful attention.

That our trade with New Zealand has fallen off a quarter of a million dollars a year since 1881 is not very strange, considering that we virtually shut out the chief product of that colony—wool—and a wool far superior to Russian or other wool. In 1888 our imports of New Zealand wool amounted to $150. Says Consul John D. Connolly in this connection: Certainly, the quantity of wool shipped from this colony to the United States is very insignificant when we take into consideration the quantity the woolen manufacturers of America must purchase annually from foreign countries. New Zealand is essentially a wool-producing country, and it seems almost incredible that during all of last year only $150 worth of wool had been exported to the United States. I am at a loss to understand why it is that those who have to go to the London wool market to purchase supplies for our American manufacturers do not come directly to New Zealand and make their purchases here; by so doing the brokerage of the London middle-man could certainly be saved. In addition to the advantage referred to, it would furnish employment to American vessels and seamen, which, of itself, should be a matter of patriotic consideration with every man who has the interests and prosperity of his country at heart. If such a course as I have suggested were adopted by American wool buyers and manufacturers generally, I am convinced it would be instrumental in developing and encouraging a trade that at present is evidently on the decline, owing to the apparent indifference of the people of the United States. The cost of freighting the wool from England would also be saved to the American buyer if he bought directly in the New Zealand market.

INDUSTRIAL NOTES.

The Philadelphia & Reading Coal and Iron Company, of Pennsylvania, has sold the Swede furnace to R. Heckscher & Sons, of Philadelphia.

The Hecla Iron Works, of Brooklyn, N. Y., were destroyed by fire on the 4th inst. The loss, inclucing a large lot of valuable patterns, is estimated at $500,000.

The fire brick for the Covington, Va., furnace has been ordered. Work on the foundations is progressing. E. J. Bird, Jr., of Ironton, O., has been elected superintendent.

It is rumored that George M. Pullman has purchased the plants and the stock of the United States Rolling Stock Company, the works being at Hegewisch, Ill., New Decatur, Ala., and Anniston, Ala.

The pipe manufacturing establishment of Shickle, Harrison & Howard, St. Louis, Mo., has erected branch works at Bessemer, Ala., which is turning out 200 tons of pipe per day. Its capacity is to be increased to 800 tons daily.

The keel of the first iron ship ever built in Maine was laid on the 4th inst., that of Cruiser No. 5, at the Bath Iron Works, at Bath, The keel for Cruiser No. 6 was laid on the 5th inst., and the work of construction will go rapidly forward.

The Alabama Iron and Steel Company has applied for articles of corporation on a capitalized basis of $10,000,000. The company proposes to erect a plant near Birmingham, Ala. Mr. Cadwell Bradshaw is said to be the prime mover in the enterprise.

The Ashland Coal and Iron Railway Company, of Ashland, Ky., paid a quarterly dividend of 1% on 22d ult. It will reline its furnace No. 2 at Ashland, Ky., some time this spring. Douglas Putnam, Jr., has been elected president, vice John Means, resigned.

The puddlers of the Brooke Iron Company, at Birdsboro. Pa., refused to accept a reduction from $3.75 to $3.50 per ton, and as a consequence the rolling mill closed down on the second inst. The stoppage of work in this mill necessitates the closing of the nail factory.

Mr. Charles Vagt, 100 Maiden lane, New York, is manufacturing some very pretty alloys of gold and silver with aluminum. They are intended to be used in the manufacture of cheap jewelry, watch cases and table ware, replacing gold and silver plate.

A cut of 10 % in wages announced by the Southern Steel Company of Chattanooga, Tenn., has been accepted by the men, who it was expected would strike. They were convinced by the officers of the company that the reduction was, under the circumstances, a necessity.

The Ellis & Lessig Steel and Iron Company, of Pottstown, it is reported, has shut down. The company desired to reduce the wages of puddlers from $4 to $3.50 a ton, and as the men objected the shut down has been decided upon. The price paid in Reading for puddling is $4 per ton. In Pittsburg, $5 and $5.50 per ton.

A special meeting of the stockholders of the Cowles Electric Smelting and Aluminum Company will hold a special meeting of stockholders at the office of the company in Cleveland, Ohio, February 12th, at 2 o'clock, P. M., for the purpose of voting upon a proposition to create $40,000 (400 shares) of additional treasury stock, the same to come from the common stock.

The Belmont Nail Company's blast furnace, located at Wheeling, W. Va., has been blown out after a 42-months run. During that period it turned out 125,000 tons of Bessemer pig iron, and has been idle only four and one-half days for want of material. The company has 10,000 tons of pig iron on hand. The company has added four puddling furnaces to its plant, making a total of eighteen furnaces.

The Bellefonte Furnace Company, at Bellefonte, Pa., on the 31st ult. closed its furnace and four ore mines for an indefinite period. It is said that the company claims it was forced to take this action on account of an increase in freight rates made by the Pennsylvania Railroad Company. A large number of men are thrown out of employment.

The Pennsylvania Steel Company is making important additions to its plant located at Sparrow's Point, Baltimore, Md., and at Steelton, Pa. The frog, switch and signal department, which now employs 300 men, is to be doubled. A bridge and structural department has been started and placed under the management of Mr. Chas. E. Billin who was recently in charge of a similar plant at the Pencoyd Iron Works, Pa.

The large thrashing machine manufactory of the Nichols & Shepard Co., at Battle Creek, Mich., announced on the 4th inst. the donation of $50,000 of its paid-up stock to its employés and workmen. It is an absolute gift, the value of the stock, it is stated, being considerably greater than its face. The company has been established at this place forty-two years and has always been noted for its just treatment of its employés.

It is reported that Messrs. Witherow & Co., of Pittsburg, Pa., have contracted to build nine new blast furnaces in the South. Two are now in progress at Bristol, Tenn. Each is now 90 feet high, with a 20-foot bosh, and six hot blast stoves 70×20 feet. One at Buena Vista has just been finished and put in blast a few days ago, and one at Graham, Va., is also finished At Florence, Tenn., one is being built, which will be ready to be blown in early next summer, and in Johnston City, Tenn., a new furnace is to be put up. Two new ones are to be built at Middleboro, Ky., and one at Rome, Ga. The iron and steel and nearly all the fire brick will go from Pittsburg.

A charter has been granted to the Adams Iron Company, of Pittsburg, Pa. The capital stock is $200,000. The company proposes to manufacture crucible steel stock by the Adams direct process. The plant will probably be located at Glenwood, Pa. The directors are George D. Blair, of Huntingdon County, Pa.; Thomas S. Blair, Jr., and F. Protzman, Sr., both of Pittsburg. (For a full description of the Adams process see ENGINEERING AND MINING JOURNAL, November 22d, 1890; also the second edition of "Howe's Metallurgy of Steel.")

The Southern Steel Company, at Chattanooga, posted a notice that after February 1st the wages of the men earning more than $1 a day would be reduced 10 per cent. It is alleged that most of the men were hired in England and brought here in direct violation of the contract labor law, and do not intend now to submit to the proposed cut. Should civil action be brought, it is said that it will cost the company $1,000 for bringing each of the men over. The latter claim that the company pays less for melting and other work than any other great mill in the country, and a strike is spoken of as probable.

According to a report from Youngstown, O., an organization is in process of formation there, which will be one of the strongest in iron circles in the United States, representing an investment of $7,735,000. The body will be known as the Mahoning & Shenango Valley Iron Manufacturers' Association, and includes the iron manufacturers of both valleys. These concerns include twenty-two furnace stacks, thirteen rolling mills, one pipe works and one wash metal plant. The output of pig iron is 1,200 tons annually and 450,000 tons of finished iron, while the number of men employed will exceed 2,000. It is the first time in the history of the iron business in Eastern Ohio and Western Pennsylvania that the iron manufacturers have been united. It is reported that the association has made a demand upon the railway companies for a reduction in freight rates, amounting to 50%.

The resolution of the Illinois Steel Company declaring the late 5 per cent. stock dividend, declared that the accounts of the company show the net earnings for the first eleven months of the current year ending November 30th, 1890, to be $1,718,330.76, being at the rate of 10·55% per annum on the outstanding capital stock. The date of payment of said 5% was altered from February 19th, as originally voted, to February 23d, 1891. As was stated in the ENGINEERING AND MINING JOURNAL at the time, Mr. O. W. Potter was given an option on control of this company's stock at about 115 per share, with a view to sell the whole capital to German parties. The monetary stringency and collapse of Baring Brothers & Co. prevented the realization of various plans of this character, including Mr Potter's plan.

The Cataract Construction Company, of New York, which is engaged in the work of tunneling a tail race parallel to the Niagara river, for the purpose of utilizing a portion of the power of the falls, is already receiving numerous applications for the lease of power, and there can be no doubt that a large manufacturing city will spring up in the vicinity of the falls as soon as the power is made available. It is probable that some of the manufacturers of aluminum by electric processes will locate there. Even Professor Hirsh, of Chicago, Ill., to whose aluminum process we give some attention elsewhere, has taken time by the forelock and already begun negotiations for use of the power. He is not at all modest in his estimate of the power he will need, as is shown in a letter of his, dated January 13th, from which we have been allowed to make the following extract: "Please inform me how much power you have to spare now or will have, how much you charge, and what contract I can make with you if I will take all the power you have available. Upon hearing from you I will give you all the necessary references. I have orders enough to use all the power of Niagara falls, but would not like to pay a fancy price for the power. All communications please address to me personally, as I am so far running my business with my own money only, although I am offered all the money anybody needs."

SOUTHERN INDUSTRIAL NOTES.

(From our Special Correspondent.)

Messrs. Enderline & Bernio. of Aberdeen, Miss., will rebuild their iron foundry and machine shops recently burned.

It is reported that the Peru Phosphate Company, of Peru, Fla., will put in new machinery and otherwise increase the capacity of its phosphate works.

The firm of S. W. Skinner & Co., of Wilmington N. C., has been reorganized under the name of the S. W. Skinner Co., which will continue to operate the machine shops.

The Bristol Foundry & Machine Co., of Bristol, Tenn., has been incorporated with a capital stock of $100 000. Buildings are now in the process of erection for the foundry and machine shops.

The Berryville Land and Improvement Company, of Berryville, Va., has been incorporated with a capital stock of $600,000. The officers are: A. Moore, Jr., president, and A. W. McDonald, vice-president.

The Charleston Lead Rolling Company, of Charleston, S. C., has been incorporated with a capital stock of $35,000. The incorporators are: James Grayden, T. A. Maylor, and G. A. Le Maistre. The company proposes to manufacture sheet lead, lead pipes, to erect sulphuric acid plants, etc.

The North Buena Vista Company, of Buena Vista, Va., has been incorporated with a capital stock of $150,000. The officers of the company are: A. T. Barclay, president, and S. M. Donald, secretary. They have recently purchased large tracts of land in that section and will develop.

The Reed River Land Company, of Newberry Mills, Va., has been incorporated, with A. J. Walker, of Wytheville, president; G. E. Hicks, of New York, vice-president, and A. A. Campbell, of Wytheville, secretary. The capital stock is $500,000. The company has purchased the Newberry mills, and is authorized to develop iron mines, build towns, establish manufacturies, etc.

The Middlesborough Town Company, of Middlesborough, Ky., has just gotten out its "Souvenir" for January, 1891. It is of the same general character as that of the last quarter, October, 1890, only it is somewhat larger and handsomer. There are many new cuts showing the progress made, while the subject matter shows a wonderful increase in industrial enterprise, even for that progressive city, in which new enterprises have been established since October to the extent of nearly $3,000,000.

The Lookout Mountain Land Company's property, including the railroad from Chattanooga to Lookout Inn, Tenn., about 600 acres of excellent land and the Lula Lake and Falls, has been sold to a party of New England capitalists, among whom are W. D. Thayer and C. H. Brown, of Boston, and T. E. Smith, of Montpelier, Vt. The price paid is $1,000,000. Extensive improvements will be made at once to make it a desirable summer resort.

A petition has been filed in the Superior Court of Fulton County, Ga., for a charter for the Chattahoochee Water and Power Company for a period of twenty years, with privilege of renewal. The objects of the company are to carry on the business of buying, selling and dealing in real estate and personal property, building, selling and renting houses, buying, owning, selling, leasing and dealing in water rights, privileges and franchises

constructing and operating water-works, canals, reservoirs, dams, and electric light and power plants, and supplying cities, communities, corporations, manufacturing enterprises and individuals with water, electric light and motive power. The incorporators are W. B. Lowe, W. H. Venable, E. P. Howard, Geo. W. Adair, T. J. James, W. T. Zachry, E. D. L. Mowbray and D. J. Howard, of Atlanta. The capital stock to be paid in is $1,000,000, with the privilege of increasing it to $5,000,000.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from his office. No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning American goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

These services are rendered gratuitously in the interest of the subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GOODS WANTED AT HOME.

2,044. An improved push planer and lock corner box machinery. Virginia.

2,045. Catalogues and price lists of cotton gins, latest improved. Georgia.

2,046. Cotton seed oil mill. Georgia.

2,047. Mill to make syrup from cane. Georgia.

2,048. Catalogues, price lists, etc., of rock crushers. Arkansas.

2,049. Circulars, prices, etc., from manufacturers of steel tug boats and barges. Arkansas.

2,050. Machinery for crushing and grinding kaolin, including motive power. New York.

2,051. Rails and equipment for 40 miles of railway. New York.

2,052. Engine and boiler. Maryland.

2,053. Full set of wood-working machinery. Maryland.

2,054. Machinery for a beet-sugar factory. Nebraska.

2,055. Prices on a 5 or 10 stamp mill. Arizona.

2,056. Machinery for a 500-barrel flour mill to be run by water power. Georgia.

2,057. A 22 × 36 horizontal Corliss or Green engine. Pennsylvania.

2,058. A 12-foot 30-inch face band-wheel, weighing about 8 tons. Pennsylvania.

2,059. A 6-foot 30-inch face-band wheel to weigh about 3 tons. Pennsylvania.

2,060. An 8 or 10-foot fly-wheel, weight about 5 tons. Pennsylvania.

2,061. A 12-inch train of rolls, consisting of six housings, pinions for rolls, etc. Pennsylvania.

2,062. A 9-inch train of rolls, consisting of 10 housings, pinions, rolls, boxes, spindles, etc. Pennsylvania.

2,063. Two 42-inch diameter, 25 to 30 feet plain cylinder boilers. Pennsylvania.

2,064. A pair small lever shears. Pennsylvania.

2,065. A saw for cutting large flats, rounds, etc. Pennsylvania.

2,066. Hydraulic rams. Florida.

2,067. Estimates on machinery for a creosoting plant costing about $75,000. Texas.

2,070. Engine, boiler and wood-working machinery for furniture factory. North Carolina.

AMERICAN GOODS WANTED ABROAD.

2,042. Catalogues and price lists of sugar machinery. Mexico.

2,043. Catalogues and full particulars as to export prices of mining machinery. South America.

2,056. American lumber for manufacture of furniture including black walnut, ash, cherry, oak, pine, Georgia pine and mahogany. Germany.

2,068. From one to four miles good second-hand 25 or 30 lb. steel rails, delivered Buffalo or Detroit, for shipment into Canada.

2,068. Catalogues and price lists of crabs, derricks, winches, cranes or other suitable machinery for handling very heavy boulders. Mexico.

GENERAL MINING NEWS.

CALIFORNIA.

NEVADA COUNTY.

HARMONY MINING COMPANY.—The recent strike of pay gravel in the mine on the north ridge of Deer Creek has proved to be very important. The gravel is giving a profitable yield, and the channel is found to be several hundred feet in width, and as the company's location covers a mile in length on the channel, there is every probability that a large extent of pay ground will be opened. The stock in this mine, which could have been bought a few months ago at 20 cents per share, is now said to be selling at $5 per share.

(From our Special Correspondent.)

SAN FRANCISCO, Jan. 29.

A supply wagon came into Daggett yesterday from the Death Valley expedition, of which mention has already been made in the ENGINEERING AND MINING JOURNAL. The party had been divided. The main branch consisting of Professors Palmer, Fisher, Coville, Bailey and Dikeman are devoting themselves to the northern part of the valley, starting from Furnace Creek, on the northeast border. The region which they will traverse is that least known. This party, after skirting along the upper end of Death Valley, will pass to the eastward toward the Amargosa country to the oasis near the head of the Amargosa River. The balance of the expedition, consisting of Professors Bailey, Nelson and Dikeman, will spend some time about Bumetis Wells. They will make the trip through that portion of the valley lying below the sea level. Through the Anvil Cañon country the party will work southward into the long branch of Death Valley, along the dry bed of the Amargosa, over much of the route followed by Lieutenant Bendere in 1867. Returning southward along the eastern side of the valley to the border of the Amargosa desert in Nevada, a detour will be made into the Funeral mountains, and six weeks hence the two branches of the expedition will unite at the oasis near the upper end of the valley. While the expedition is primarily for the purpose of investigating and classifying the animal and vegetable life found in the desert, much information will be gathered regarding the great borax and borate deposits, the mammalia of the Funeral mountains, about which there is much curiosity, and last, but by no means least, whether the stories of rich mineral deposits existing in the valley are true or not.

The stand taken by Governor Markham with regard to hydraulic mining has won him a host of friends in the mining sections of the State. During the past week a concurrent resolution memorializing Congress to improve the Sacramento River and appropriate $1,000,000 for that purpose was introduced in the Legislature. The preamble was very strong and attributed the filling of the river to hydraulic mines. To pass the resolution would be to nullify the work of the mining contingent, and it looked as if a conflict between the opposing factions would ensue, but after prolonged negotiation the matter was compromised by striking out all reference to debris and inserting instead the words "by reason of the neglect of the National Government."

Major A. McKenzie, Major Heur and Captain D. E. Kingman, composing the committee sent by the Federal Government to consider the improvement of the Sacramento and Feather rivers, arrived a few weeks ago. They will confine their inspection to outlets and taking of soundings, and no survey will be made. That some immediate action is necessary, is apparent, when it is remembered that in 1850 the river at Sacramento was perfectly clear and allowed deep-water vessels to anchor off the city. Now, only a flat-bottomed boat of light draught can get up so far. The commission appointed under the Briggs act forwarded its report to Washington this week. It is a matter of common rumor that a strong showing has been made in favor of a system of dams for impounding mining debris, for which sites are numerous. The government is strongly recommended to assist in their construction, particular attention being called to the fact that the nation is losing $8,000,000 in gold annually while the industry is suppressed.

COLORADO.

CLEAR CREEK COUNTY.

GILT EDGE MINING AND MILLING COMPANY.—This company has been incorporated by E. M. Christy, George R. Back, Robert H. Buck, Samuel D. Barnes and John Varnum. Its capital stock is $300,000. Principal business office at Denver. Its property is located in Trail Creek and Cascade districts.

GARFIELD COUNTY.

GRAND RIVER COAL AND COKE MINES.—As the day shift, composed of 75 miners, were about to leave this mine on the 3d inst., a terrific explosion occurred. The hoisting machinery was started and 75 miners had been brought to the surface, when the flames reached the shaft and came up with such force that every body was driven away. Explosions have followed every few hours. Had the first occurred when the miners were at work no fine would have escaped. The mine has been on ore several times before in the last ten years.

OURAY COUNTY.

AMERICAN BELLE MINES, LIMITED.—Articles of incorporation were filed in Denver on the 25th ult. by the English syndicate which recently purchased the American Belle mines, and to which we referred in our issue of December 20th. The incorporators are: Thomas Phillpotts, chairman of the company, and Thomas John Bewick and Bedford McNeill. The capital stock of the company is placed at £400,000. It is divided into 400,000 shares of £1 each. The directors who will have control of the company's affairs for the first year are Frederick Powell Crowther, Thomas Phillpotts, Thomas John Bewick and George Crawford, with Bedford McNeill as secretary.

FLORIDA.

(From our Special Correspondent.)

A company is being organized to develop the Peace River phosphate mines, owned by Isaac Whittaker, of Kansas City, Mo.

DUVAL COUNTY.

STONWALL PHOSPHATE COMPANY.—This company has been incorporated with a capital stock of $500,000, for the purpose of mining phosphates, erecting works, etc. J. R. Tysen, J. M. Schumacher and Matthew Souville are the incorporators.

GEORGIA.

LUMPKIN COUNTY.

(From our Special Correspondent.)

CAPPS GOLD MINE.—This property, in the suburbs of Dahlonega, has recently been sold to a company of Alabama capitalists, who will develop it at once. This property was owned by Capt. H. D. Ingersol, manager of the Hand Gold Mining Company, and was sold by him because his other duties required his undivided attention.

WALKER COUNTY.

W. M. Tatum, of Georgia, and N. A. Hammond, of Chattanooga, have secured several thousand acres of valuable coal and iron lands in this county. Several Chattanooga and Atlanta men are also interested in it, and the property will soon be developed. The headquarters of the company will be in Chattanooga. Its plant will be located at Kingston, a new town on the Chattanooga Southern Railroad.

KANSAS.

CHEROKEE COUNTY.

A special report shows that during the week ending January 31st the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 1,880,400; zinc ore, pounds sold, 379,800; lead ore, pounds sold, 90,536. Sales aggregated a total value of $6,025.

MARYLAND.

MONTGOMERY COUNTY.

(From our Special Correspondent.)

ALTON GOLD MINE.—This mine, formerly known as the Montgomery property, was investigated during the latter part of 1890 by Chicago capitalists with a view to purchasing. Over 100 tons of ore were taken out and worked at the mill of the Harrison gold mine, near by; the result of the test was satisfactory and the Chicago parties purchased it at once. Henry Watson, a member of the company, has been elected general manager. He is an energetic business man, formerly in the quarry business, and says that he will thoroughly develop the property before going to the expense of erecting a mill; but, in the near future a complete 20-stamp mill will be erected, if the developments justify it. In the vein matter, which is quartz, are found three leads of galena two or three inches wide, of extraordinary richness, and gold penetrates the galena in all directions. The company is basing its calculations upon the low grade of ore in the mine, but it would take very little of this rich ore to pay well.

KIRK MINING AND MILLING COMPANY.—This company ran during the past year principally for the purpose of development, though incidentally it produced considerable bullion. An adit has been driven into the hillside for a distance of about 280 feet. The vein appears to be about 3 feet wide, and is composed of quartz and talcose matte. This ore is low grade, though it is calculated that, by working considerable quantities, a reasonable profit may be expected. It is upon this ore that the mill ran during the year. In the way of development a shaft has been sunk, which at present is at a depth of 80 feet, and the manager expects very soon to strike the vein, indications of which have already shown themselves in small quartz leaders in the bottom of the shaft. The mill consists of a Wiswell mill, two bumping tables and a Golden Gate concentrator. The concentrates, however, have been found unprofitable, and are no longer saved. W. D. Craven is the vice-president and general manager of the company. Its post office address is Great Falls.

MICHIGAN.

COPPER.

Capt. John Daniell, of the Tamarack-Osceola-Kearsarge et al. mines, says the Boston *Herald*, is in Boston in conference at the new offices of the companies he represents. Among the matters under consideration is the equipping of the Tamarack, Jr., mine. It has need of a new compressor, rockhouse and other machinery, not to mention a stamp mill, which must come later. There are surplus stamping facilities, the captain says, at the Tamarack and Osceola mills, which can be used to treat Tamarack, Jr., ore, but the mine will require a mill of its own. The compressor will be required before the mine can produce much ore, and it cannot be told exactly when this can be obtained. It will be ordered at once. Captain Daniell says he is satisfied with the appearance of Tamarack, Jr. The Kearsarge, he says, is looking better than it has sometimes. The Calumet conglomerate has not developed anything of consequence yet, but if the Centennial turns out good, it will behoove the Kearsarge to exploit further for the conglomerate. He says he has seen some rich rock from the Centennial mine, but is

not familiar enough with the mine to say what the quantity is. Concerning the report that the Clark-Bigelow aggregation were negotiating for the Lac la Belle stamp mill in Keweenaw County, he said that the matter had not been considered, and seemed to think it improbable.

QUINCY MINING COMPANY.—A representative of the ENGINEERING AND MINING JOURNAL learned from Mr. Smith, of the firm of Mason & Smith, 56 Broadway, that the directors of this company, at a meeting held on the 4th inst., voted to purchase from his firm the Pewabic mining property, at an estimated cost of $800 000, and to pay for the same by a delivery of the 10,000 shares of Quincy treasury stock, at the rate of $80 per share. The purchaser will take possession as soon as the special master's sale of the property to Mason & Smith—a notice of which appeared in the ENGINEERING AND MINING JOURNAL, January 31st—is confirmed.

TAMARACK, JR., MINING COMPANY.—The following telegram concerning the lode recently cut in No. 1 shaft has been received: "The lode is ten feet wide, four feet of which is excellent; six feet, good. It will average 3%. It is cut by a crosscut thirty feet vertically or sixty feet on the incline below the point where the shaft penetrated it."

Following is given the January outputs of mineral of the different companies which have reported up to date in tons:

Calumet & Hecla	3,545	Peninsula	60
Atlantic	228	Franklin	204
Quincy	451	Allouez	116

IRON.

GOGEBIC RANGE.

The annual meeting of the Superior, Palms, Aurora and Comet mining companies, which are controlled by the Wisconsin Central Railway Company, was held in Chicago recently. The following board of directors was elected for the Superior Mining Company: Charles L. Colby, New York; Edwin H. Abbot, Boston; Colgate Hoyt, New York; J. L. Colby, Cleveland; C. H. Ropes, New York; L. H. Severence, Cleveland; Gardner Colby, New York. All but 229 shares out of the 25,000 were voted as proxy by the attorney of the company, Howard Morris. The directors for the Palms Company are the same as those of the Superior except that A. L. Deckerman is a member instead of Mr. Severence.

MARQUETTE RANGE.

CHAPIN MINING COMPANY.—Mail advices concerning the fire in this company's mine have been received. It originated on the sixth level, and was discovered at 6:15 P. M. by the smoke which poured from C shaft. Its origin is unknown, but is said by some to have been frictional combustion. Eight men were entombed at the eighth level. Assistant Superintendent McNaughton headed a rescuing party, and succeeded in bringing out seven, two of whom, Jerry Bennet and Tom Edwards, were dead. The eighth man, Charles Hosking, by obtaining fresh air from the air hose, succeeded in reaching the surface unaided.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, Feb. 2.

There has been a large output of ore during the past week, but rather light sales in comparison with the output, owing to a decline in prices. The average price for zinc ore was $22 per ton, but lead held its own through the week, and closed at $24.50 per thousand. Many of the large producers are still storing their zinc ore in bins, holding for better prices.

Following are the sales of ore from the different camps as far as reported: Joplin mines, 1,500,200 pounds zinc ore and 188,060 lead; value, $21,017. Webb City mines, 972,630 pounds zinc ore and 81,660 lead; value $12,699.60. Carterville mines, 1,317,930 pounds zinc ore and 104,540 lead; value, $17,058.36. Zincite mines, 339,050 pounds zinc ore and 4,250 lead; value, $4,002. Lehigh mines, 174,450 pounds zinc ore; value, $2,006. Oronogo mines, 41,840 pounds zinc ore and 10,620 lead; value, $715. Galena, Kan., mines, 379,800 pounds zinc ore and 90,538 lead; value, $6,075. All districts, total value, $63,572.96.

The spelter output of Pittsburg, Kans., for week ending January 31st was: W. & J. Lanyon, 96,800 pounds; S. H. Lanyon & Brother, 97,000 pounds; R. Lanyon & Co., 18 000 pounds; Granby M. & S. Company, 96,600 pounds; Weir City Zinc Company, 145,000 pounds; total, 453,400 pounds. Coal output for same week, 925 cars, aggregating 18,500 tons.

The Illinois Zinc Company was active buyer in the ore market last week, but not inclined to advance prices.

The Bay State mines, on the Oswego land, produced 17,750 pounds zinc ore last week; and Richards & Co., on the Interstate land, produced 40,190 pounds.

Joshua Hicks, who has been prospecting on the Home Mining Company's land for more than a year, reports having opened a large body of ore.

On B. F. Horton's land on Turkey Creek, about four miles east of Joplin, a tract of undeveloped land, a good deposit of zinc ore has been cut at a depth of 120 feet by a diamond drill.

Electric power improvements are being completed by the Southwest Electric Light & Power Company on Shoal Creek at Grand Falls, which is located 4½ miles south of the city of Joplin and, was purchased last year by a syndicate, which under the management of C. E. Hart, a thorough electrician, immediately commenced extensive improvements that have cost the company in round figures $150,000. The company has just put in place a 66-inch Leffel turbine wheel, and will put in two more, which will furnish 2,000 horse power. This will be utilized in the mines for pumping, hoisting, driving crushers, rolls and concentrating plants and lighting.

HOFF LAND AND MINING COMPANY.—This company was recently organized with a capital of $100,000. Twenty-five thousand dollars was called in for a development fund, and $25,000 was paid for a 40 years' lease of 8% royalty, including all machinery and fixtures on and about the Buckeye mine, at Bellville. This property is located south of and joining the noted Standard and Holden properties, and east of and joining the property and in the center of the Bellville district, so famous for the quantity and quality of its zinc ore. It is the intention of the new company to at once begin new prospecting and developing, supplying new and improved machinery as fast as needed. It is understood that Mr. Campbell, who is prominently mentioned in connection with this lease, is also negotiating for a sale of the fee of the land under lease by the Standard Lead and Zinc Company.

MONTANA.

MEAGHER COUNTY.

A company has been formed at Helena to build a smelter at Castle, to treat the ores of the great Cumberland mine, and work on a 60-ton smelter with blast furnaces will begin at once. It is estimated to cost $75,000, and is expected to be finished by May 1.

The directors of this enterprise are John Woodson, J. Anderson, J. R. Sherman, Wm. Gerden and Len Lewis. It is an undertaking of great importance to the future of Castle. The contract for the plant is reported to have been let during the week.

SILVER BOW COUNTY.

The discussion of the smoke nuisance in Butte has continued one of the most absorbing topics of the day. At a meeting of the city council during the week the smoke committee of that body made a report, which was adopted, and which will require the smelter people to adopt some method for the abatement of the smoke nuisance.

An abstract of the report is given as follows: After due inquiry through correspondence and the practical demonstration made by Mr. Hutchinson we have come to the conclusion that the smoke and fumes emerging from smokestacks and smelters constantly menacing the lives of people, can be abated. We now, therefore, recommend that the Board of Health be instructed to enforce ordinance No. 167, articles 5 and 14. The ordinance and its articles referred to in the report are here appended.

That it is a public nuisance to cause or suffer the carcass of animal or of any offal, filth or noisome substance to be collected, deposited, or to remain in any place to the prejudice of others; to throw or deposit any offal or other offensive matter, or the carcass of any animal in any watercourse, lake, pond, spring, well or common sewer, street or public highway.

To erect, continue or use any building or other place for the exercise of any trade, employment or manufacture which by occasioning noxious exhalations, offensive smells, or otherwise is offensive or dangerous to the health of individuals or of the public.

That it is hereby made the duty of the Board of Health of Butte to cause the summary abatement of any such nuisance at the proper expense and cost of the party or parties responsible for or permitting the nuisance.

That the violation of any of the foregoing provisions or any interference with the Board of Health in its execution and enforcement of this ordinance shall be punishable by fine not exceeding $200 for each offense, or by imprisonment not exceeding three months for each offense, or by both such fine and imprisonment, at the discretion of the court. (See ENGINEERING AND MINING JOURNAL, January 10th, 1891, for "Remedies for the Smoke and Sulphur Fume Nuisance.")

ANACONDA MINING COMPANY.—A meeting of the trustees of this company was held in Butte during the week. Two changes were made in the membership of the board of trustees, which now consists of the following five gentlemen: M. Kirkpatrick, W. W. Dixon, F. E. Sargeant, M. Carroll and G. C. Tucker. Later M. Kirkpatrick was elected president of the board, and F. E. Sargeant, secretary. The property included in the organization represented by this board of trustees includes all the mines known as the property of the Anaconda Company in Butte, the smelting works in Anaconda and all other property of the Anaconda Company in both cities. The present board of trustees hold office for three months.

BOSTON AND MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The figures of fine copper product for January are reported, and permit the following comparison:

	1891 Pounds.	1890. Pounds.	1889. Pounds.
January	2,175,000	1,900,000	2,150,000
First six months of fiscal year	13,650,000	13,122,000	10,814,241
July 1st to January 31st	15,825,000	15,022,789	12,964,241

The January product of 2,175,000 pounds compares with 2,150,000 pounds in December, the same in November, 2,500,000 pounds in October, 2,300,000 pounds in September, 2,400,000 pounds in August and 2,150,000 pounds in July; average, first six months current fiscal year, 2 275,000 pounds.

A large lot of Montana matte aggregating 1,000 tons was recently sold to be delivered in Liverpool at ten cents per pound of copper contained.

NEVADA.

ELKO COUNTY.

BELLE ISLE MINING COMPANY.—The stopes on the 350-foot level continue to produce a high grade of ore. Nine cars of very high-grade ore were broken during the week ending January 24th, and 42 cars of a good grade of concentrating ore were hoisted.

NORTH BELLE ISLE MINING COMPANY.—A report from this property on the 22d ult. stated that a cross-cut had been started east from the 400 north gangway opposite the cross-cut to the vertical winze and has cut through 18 inches of good concentrating ore, showing seams of good ore in the face. North drift from Belle Isle 450-foot level shows the vein getting harder and bunches of rich ore. Joint east crosscut, same level, shows some bunches of fair ore. The 500 stopes are not looking as well as at last report. Sixty-nine cars of ore were broken during the last week. The concentrator crushed 300 tons, estimated assay value $15.08, giving 26.26 tons wet concentrates, estimated assay value $143.45.

NORTH COMMONWEALTH MINING COMPANY.—At the annual meeting of this company on the 28th ult., 85,125 shares of stock were represented. The following officers and directors were elected: E. Scott, President; F. A. Berlin, Vice-President; Thomas Bell, G. W. Grayson and T. B. Pheby. J. W. Pew was reappointed Secretary, and F. F. Coffin Superintendent. The secretary's report showed an indebtedness by the company of $1,992.-03. Superintendent Coffin was not able to prepare his annual report in time for presentation at the meeting on account of an accident to his son.

(From our Special Correspondent.)

STOREY COUNTY—COMSTOCK LODE.

SAN FRANCISCO, Jan. 29.

The following is a statement of Comstock ore worked during the past week:

	Tons.	Av. val.
Con. California & Virginia	1,610	$19.25
Chollar	552	19.87
Justice	190	23.81
Overman	*495	15.17
Sa age	520	15.65
Yellow Jacket	240	18.00

*Car sample.

All who are interested in mining properties in this state are suffering considerable uneasiness just now on account of the proposition being made before the legislature to tax all patented mining claims. It is thought, however, that mining men, representing as they do the wealth of the State, will be able to defeat any measure of the kind that may be introduced.

Several conferences have taken place among the magnates of the Comstock for the purpose of considering means by which milling and transportation charges may be reduced, and it may be accepted as certain that measures will be adopted having this end in view. It has transpired, however, that this matter was discussed subsidiary to one of infinitely greater importance, viz, that of draining the lower levels of the Middle and North End mines, thus completing the plan inaugurated when operations were commenced in the Crown Point incline for the purpose of draining the lower levels of the Gold Hill mines. On Tuesday a virtual agreement was entered into by John W. Mackay, J. C. Hood, Alvinza Haywood, W. S. Hobart, S. L. Jones and others, having control of the Middle and North End mines, by the terms of which, after a lapse of five years, deep mining will be resumed along the entire Comstock lode. The combination shaft owned by the Potosi, Savage, Chollar and Hale, and Norcross companies shut down early in 1886 and was the last of the deep shafts to shut down when deep mining was abandoned. For a time the thousands of men out of employment caused a gloom to overshadow Virginia City and Gold Hill, and the stock market was much depressed. Subsequent discoveries in several of the mines revived interest but no very great confidence has ever been felt in the upper-level developments. The decision having been arrived at, to resume work in the lower levels, is matter for congratulation to miners on the Comstock and to all those who believe that hidden away under waters lie new bonanzas of ore, perhaps equaling those of the past. The first step to be taken will be to start the Cornish pumps in the combination shaft, and lower the water until the hydraulic pumps can be recovered and set to work. This will drain the lower levels of the Middle mines and also greatly assist in draining those of Gold Hill and the North End. When this work is well commenced the pumps at the C. C. shaft will be started. A plan has been

devised for the drainage of the entire lode, and the above will simply be the initial steps in this most important undertaking.

The mills now at work upon Comstock ore are the Nevada, running about 25 stamps out of a complement of 60, the Mexican with 22 of 44, the Brunswick with 30 of 76, and the Eureka working its full power of 60 stamps. The Morgan mill is running on tailings. The Nevada mill recently shut off its electric power, and is now running exclusively by the energy developed by the Pelton wheel.

POTOSI MINING COMPANY.—Good ore is reported in the winze, now down about 95 feet in the slope below the 1,230 level, scalping along the foot wall. If this rumor receives confirmation it will be of importance, for no ore has been found in the foot wall for several hundred feet. The Hayward and Hobart crosscut, 1,130 level, is out over 100 feet, and since leaving the eight feet of good ore first found, there has been no change of importance. On the 1,300 level the main south drift from the Chollar incline is in some 520 feet, and very soon connection will be made between this drift and the Potosi winze, and crosscuts started on this level.

SIERRA NEVADA MINING COMPANY.—At the annual meeting held a week ago, Vice-President C. Hirshfield was appointed to confer with the Union Consolidated and Mexican Mining companies which, with the Sierra Nevada, own the Union shaft, with the end in view that explorations through that shaft be resumed. As a result of the negotiations, work is to be resumed through the shaft by the Union Consolidated and Sierra Nevada companies as soon as the necessary preparations can be made. The Mexican Company will continue to work through the Ophir shaft, but will have the privilege of working through the Union shaft at any time by paying its proportion of the expense. Roger Prendergast, an old Comstock foreman, has been appointed superintendent of the Union shaft, and the hoisting plant is now being overhauled and everything got in readiness for starting. Between this shaft and the west wall of the Comstock lode, and from the 1,600 level to the surface there is in these mines a very large section of the ledge which is practically unexplored. As the Sierra Nevada Company will cease work through its own shaft, and the Union Company will suspend work through the Ophir shaft, the expenses of the companies will not be increased to any appreciable extent, there being no pumping to do, and by using only one compartment of the Union shaft down to the 1,600 level, the expenses may, indeed, be even less than at present.

YELLOW JACKET MINING COMPANY.—Work is to be inaugurated in this company's mine that promises to be of interest. In 1869 when big dividends were paid from the workings of ore extracted from the 1,800 level, a fire stopped all work in that neighborhood, and no development work has been done since, nor in the corresponding levels of Challenge, Confidence and Imperial. All these are to be thoroughly prospected, and crosscutting has already commenced on the 680 level of the Yellow Jacket, where it is claimed good ore was left at the time of the fire. The 680 level drift will be continued through the Challenge, Confidence and Imperial ground. In the Challenge-Confidence west crosscut, Yellow Jacket 900 level, there is a large body of fair-looking quartz, but so far nothing of value has been found.

NEW MEXICO.

SILVER BELL.—News reaches us that a rich strike of chloride and native silver has recently been made on this property. The vein is in granite, and numerous feeders run to it. In sinking, three pipes of very rich ore have been cut. The rest of the vein is from three to six inches wide and assays well in silver. The claim lies right on the main road between Fort Bayard and Pinos Altos, and is owned by Dimmick Bros.

SANTA FE COUNTY.

SANTA FE COPPER COMPANY.—In a recent interview with Messrs. Lewisohn Bros., of this city, relative to the affairs of this company, a reporter of the ENGINEERING AND MINING JOURNAL learned much that will bring cheer to the hearts of numerous stockholders. It is a well-known fact that the property has been a non-producer for about a year, owing to a complication of causes. During the past winter the management has been engaged in developing and equipping the mine for the purpose of permanent and systematic operation. A new 100-ton concentrating plant has been erected by the Fort Scott Foundry and Machine Works, of Fort Scott, Kans., and will be in operation by March 1st. The furnaces will be started about the same time. The roast heaps have already been fired. Our informant states that as soon as the company can prove to the Santa Fe Railroad Company, by its smelter returns; that it has a mine and proposes to work it permanently, the latter will run a spur to the property; that the development work which has been carried on during the winter has proved that the deposit exists, and that the announced policy of the management is for permanent operation. In this connection the following extracts taken from a letter written on the 21st ult. by the resident superintendent, Mr. J. T. McLaughlin, are pertinent: "Everything is going along nicely. We have the rolls set and the screens up, the necessary shafting and belting in place, and started up yesterday. We are reaching good ore in the mine. The stopes are holding out very nicely. This is particularly true of the incline in the south drift. Here there is five feet of ore, two feet of which is good smelting ore. Hoisting operations were started to-day.

OHIO.

OIL.

A suit important to producers was recently decided in the Common Pleas Court. The suit was brought to clear the title and settle the question of the right of the State of Ohio to lease land for oil purposes. The land in question was a portion of the eastern bank of the St. Mary's reservoir, which was considered one of little value until oil was discovered in it. The State had leased the tract for drilling purposes. Suit was brought by W. G. Kishler, who claimed the State had no title to the land. The State showed by the record that the land was part of the public works, and the court so decided. The case will be taken to the Supreme Court.

PENNSYLVANIA.

COAL.

The Schuylkill Coal Exchange has issued a report dated Pottsville, January 31st, 1891, which shows that the collieries drawn to return prices of coal sold in January, 1891, to determine the rate of wages to be paid, make returns as follows: Gilberton Colliery, $2.42·8; Bear Ridge Colliery, $2.28·6; Schuylkill Colliery, $2.35·7; Keystone Colliery, $2.38·3; North Ashland Colliery, $2.24·5 (P. & R. C. & I. Co.). Total, $11.69·9. The average of these rates is $2.33·9. The rate of wages to be paid for work done during the last two weeks of January and the first two weeks of February, 1891, is 5% below $2.50 basis.

A number of leading citizens of Lehman Township, according to report, are fully determined to find out whether or not there is coal in that section. Two thousand eight hundred dollars have been already subscribed, and $3,200 is the estimated expense of putting down a diamond-drill bore hole 1,500 feet. The drilling will be done near Raub's mill, West Lehman. The farmers are confident that deposits of coal underlie their land and are determined to find out.

EUREKA COAL COMPANY.—This company, of Pittsburg, has been incorporated with a capital of $70,000. The directors are: William A. Dinker, L. D. Harper, Pittsburg; William H. Graham, William A. Stone, Allegheny City; William McCune, West Newton.

J. C. HAYDEN & CO.'S NO. 1 SLOPE MINE.—Eighteen miners were drowned in this mine, at Jeanville, Luzerne county. The accident was caused by the breaking into the mine of a large reservoir of water which was stored in an abandoned portion of the mine known as No. 8 left. The water had been accumulating for years. Charles Boyle and Patrick Cole were at work in No. 1 left, just below No. 8. Boyle struck his pick in the roof of the chamber, making a large hole, and the water came pouring through into the breast and gangways. It was impossible to stop the opening. Boyle and Cole had to flee for their lives. As they went along the gangways they gave warning, and in this way saved many men who would otherwise have perished. The company has already begun to pump the water out of the mine, and the bodies now in it cannot be recovered until it is clear. The mine is reported badly wrecked, and, according to reports, it is doubtful if it can be pumped out for some time.

OIL.

Exports of refined, crude and naphtha from the following ports from January 1st to January 31st were as follows:

	1891. Gals.	1890. Gals.
From Boston	243,520	225,882
Philadelphia	15,069,909	8,300,622
Baltimore	1 266,150	550
Perth Amboy	598,314	393,743
New York	30,859,684	35,707,795
Total	48,037,577	44,628,592

SOUTH CAROLINA.

At the last meeting of the State Legislature the act recommended by Gov. Tillman for the appointment of a commission to take charge of the phosphate mining industry was passed, and the new law will go into effect upon March 1. The commission is to consist of the Governor, the Attorney-General, the Controller-General and two citizens who will be appointed by the Executive.

The act provides that the board shall assume charge of all river phosphate mining in the navigable streams of the State, and shall collect from all miners a royalty not to exceed $2 per ton on all rock mined. The present royalty is $1 per ton, and the companies say that any heavier tax than this will be nothing short of extortion. The act gives the commissioners extraordinary powers. It authorizes them, in case deposits are molested or mined illegally, "in the name and on behalf of the State of South Carolina, to take such measures or proceedings as they may be advised are proper to enjoin and terminate any such molestation, interference, or obstruction, and place the State, through its agents, the said Board of Phosphate Commissioners, or any one under them authorized, in absolute and peaceable possession and occupation of the same." As the three State officers on the commission are men who have publicly avowed their antagonism to the existing phosphate regulations, the phosphate miners are naturally uneasy. With power limited only by the constitution, the commissioners can ruin the industry if they see fit.

SOUTH DAKOTA.

PENNINGTON COUNTY.

HARNEY PEAK TIN MINING COMPANY.—A representative of the ENGINEERING AND MINING JOURNAL learned at the Eastern office of this company, in this city, that a concentrating plant of 250 tons daily capacity is to be erected at Hill City during the ensuing year. Mr. Julius L. Horning, the company's constructing engineer, left this week for the far West on an inspecting tour. He will make a thorough study of the low grade ore concentrating plants in use in Colorado, Montana and other of the Western States for the purpose of determining the kind of a plant best adapted for concentrating the company's ore. The power plant is to be operated by water, and will be of a 500-ton daily capacity. The arrangement will be such that this 250-ton additional capacity can be utilized on the construction of an addition to the mill. As is known to the readers of the ENGINEERING AND MINING JOURNAL, there is a 200-ton mill at the Etta mine, 18 miles from Hill City, the place where the company started operations. This point is the location of most of its mines. This milling plant has stood idle for some time. (See ENGINEERING AND MINING JOURNAL, May 29, 1886.) We have a statement from an officer of the company to the effect that this mill will be overhauled, re-equipped and placed in operation during the present year.

The company claims it has demonstrated that cassiterite is to be found on its properties at a considerable depth. A shaft in the G. W. Coats mine is now being sunk for a third level. The openings made on the first and second levels show bodies of ore of a promising nature. A shaft in the Cowboy mine is also being sunk below the second level. An assay of the ore taken from the lode at this point is said to have returned 81 pounds of cassiterite to the ton. At the Nevada No. 2 mine the shaft has been sunk 90 feet, and cross-cuts driven to the foot and hanging walls, showing the mineral bearing belt to be 85 feet wide. This shaft has been equipped with an air compressor plant. Sinking will be resumed within the next 60 days. In the Gertie mine a drift has been run on the lode at the 90-foot level, for a distance of 200 feet, proving the ore body to be of a width averaging between three and five feet. A winze has been sunk toward a second level. A three-compartment shaft in the Addie mine has reached the 200-foot level. A station is to be put in at this latter point, from which drifting on the lode will be carried on. The shaft will be sunk a third lift. (For particulars regarding the Dakota tin mines see ENGINEERING AND MINING JOURNAL, Nov. 6, 1886.)

TENNESSEE.

MADISON COUNTY.

It is said that a Boston syndicate has bought between 60,000 and 70,000 acres of fine timber lands in this county. On Saturday last George H. King, of Kansas City, Mo., a director of the New England Southern Timber and Land Company, of Tennessee, and Horace D. King, of Lynn, Mass., treasurer of that company, completed negotiations for the purchase of the William Johnston timber and mineral lands in that county. The cash payment was $91,000, the consideration for the whole being $175,000. The tract is said to contain large deposits of magnetic iron ore. In addition to the purchase the syndicate has consummated a deal with A. S. Johnson, of Greenville, Tenn., by which 11,000 acres of timber and mineral lands in fee simple come into its possession, besides the mineral rights to several thousand acres additional. This company is composed mostly of Massachusetts capitalists, who, it is said, contemplate a rapid development of the property.

UTAH.

JUAB COUNTY.

CENTENNIAL-EUREKA MINING COMPANY.—Mr. W. W. Chisolm, president of this company, states that the mine is showing a large amount of good ore. Not only the dump but the power-house and some of the drifts in the mine are filled with ore, which will remain until the company decides to resume shipments. Development work is being continued and the vein improves as drifts are driven southward. The last sale of ore was made November 10th, and the last shipment was made in October, but the company has been paying dividends regularly from its surplus.

VIRGINIA.

AMHERST COUNTY.

(From our Special Correspondent.)

JAMES RIVER STEEL AND IRON COMPANY.—This company has been incorporated with a capital stock of not less than $200,000 nor more than $1,000,000. The officers are: E. A. Saunders, president; L. T. W. Marye, secretary, of Richmond. It will develop coal and iron mines.

FAIRFAX COUNTY.

EUREKA GAS, COAL AND COKE COMPANY.—This company has been incorporated with Ralph Izard, President, and B. W. Dickinson, Secretary. The capital stock is $75,000. The company will sink gas wells, develop coal mines, etc.

WEST VIRGINIA.

GRANT AND TUCKER COUNTIES.

(From our Special Correspondent.)

FAIRFAX COAL AND COKE COMPANY.—This company has been incorporated at Piedmont by H. G. Davis, S. B. Elkins, H. G. Buxton and others for the purpose of developing coal mines in Grant and Tucker counties. Its capital stock is $300,000.

WYOMING.

UINTA COUNTY.

(From our Special Correspondent.)

VICTORIA COPPER COMPANY.—This company has recommenced work under the management of R. C. Chambers receiver; large quantities of copper ore are reported on the dump, and some is being hauled to Ft. Bridger for shipment.

FOREIGN MINING NEWS.

AUSTRIA.

The *Board of Trade Journal*, in commenting on the discovery of quicksilver at Wippach, in Corinthia, as mentioned in our issue of November 22d, says that as long as twenty years ago children, while playing near the Wippach at low water, had been known to find the metal. No attention was paid to the circumstance until recently, when a mining engineer drew attention to the fact. It has subsequently been verified by a number of well-known officials from Trieste, who succeeded, with little trouble, in getting quicksilver. It is said that, as the metal is to be found at a depth of only 1 meter, mining operations can be prosecuted on the surface. The discovery of quicksilver at so slight a depth is phenomenal from a geological point of view, the metal being usually found in old geological formations.

CANADA.

PROVINCE OF ONTARIO.

(From an Occasional Correspondent.)

GOLD HILL.—Recently there was cut in the Bernhardt shaft of this mine a rich lode. The find was in virgin ground, about 400 feet from the nearest of the old workings, and it has gradually come to light that the vein is four feet wide, the ore assaying from $100 upward per ton.

(From our Special Correspondent.)

KINGSTON, Jan. 31.

Considerable phosphate has been hauled to the docks at this place. It brings $14 per ton of 2,240 pounds, for 80% and upward. This figure is about one-half of what is paid in England.

The nickel boom has stimulated local prospectors. In the weeks previous to the snowfall a number of samples of nickeliferous pyrrhotite were brought in for assay.

EAST INDIA.

Very good progress has been made by the three leading Colar gold mines in the past year, though the other properties in that district and in the Wynaad have not shown any marked improvement. A good deal of exploration work has been done, and some more or less important discoveries have been made in the neighborhood of the Mysore; but the actual production of gold is still practically made by three mines, though a fourth, Balaghat-Mysore, is showing some improvement as the workings are deepened. Up to the end of 1887 the amount of the precious metal raised from the Indian mines, from the starting of the industry upon a large scale in 1879, was about £143,000; in 1888 the production was about £135,000, in 1889 a little over £300,000, and last year it reached a total of about £415,000, raising the aggregate production to the end of last year to a little short of a million sterling, of which fully two-thirds has been obtained from the Mysore mine. During 1889 the Mysore company paid 75% in dividends, and 50% in cash and shares for the sale of a portion of its property. On account of 1890 45% has been paid, and a further distribution of 30 or 35% is expected to be paid when the accounts are paid up.

The approximate value of gold obtained for 1890, 1889 and 1888 was:

Mysore	£229,000	£193.000	£73,6?0
Ooregum	104,000	22,700	26,300
Nundydroog	59.000	62,400	15,200
Balaghat	13,800	14,000	10,400
	405,800	292,100	125,500

GERMANY.

The occurrence of a fearful disaster at the Hibernia colliery at Gelsenkirchen, in Westphalia, was recently reported in Berlin. Forty men are reported to have been killed and thirty injured.

MEXICO.

DURANGO.

CANDELARIA AND DURANGO MINING COMPANY.—This company has just been organized in the City of Mexico for the purpose of establishing the claims of Mr. Mark Birmingham to the Candelaria mine, situated at San Dimas, which claims Mr. Birmingham has ceded to this company. Bonds are to be issued, convertible into stock at the option of the holder, at certain fixed rates. The mine, says *El Minero Mexicano*, has been producing about $150,000 a month for a number of years, and a very conservative estimate of its value would be $10,000,000. Messrs. Mark Birmingham, C. F. Patton, Guy C. Sea, T. Perea and Richard E. Chism are the directors of the new company.

MEETINGS.

Adams Prospecting Company, at the office of the company, No.53 Broadway, New York City, February 10th, at 2 P. M.

Batopilas Mining Company, at the office of the company, Mills Building, 15 Broad street, New York, February 24th, at 12 o'clock noon.

United Verde Copper Company, at the office of the company, 35 Wall street, New York, February 16th, at 12 o'clock noon.

Colorado Smelting Company, at the office of the company, in Pueblo, Colo., February 9th, at 12 o'clock noon.

DIVIDENDS.

Silver Mining Company, of Lake Valley, dividend of 10%, $50,000, payable February 12th, at the office of the company, No. 119 South Fourth street, Philadelphia, Pa. Transfer books close February 5th and reopen February 13th.

Aspen Mining and Smelting Company, dividend No. 21 of 10 cents per share, $20,000, payable February 14th, at the office of the company, No. 54 Wall street, New York. Transfer books close February 11th and reopen February 16th.

Boston and Montana Mining, dividend No. 11 of $1 per share, $125,000, payable February 20th, at the office of the company, in Boston, Mass.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Amn't per share.
Adelaide Cop., Nev.	2	Dec. 27	Jan. 31	Feb. 18	·06
Alliance, Utah	11	Jan. 5	Feb. 7	Mar. 2	·10
Brunswick Con., Cal	1	Jan. 8	Feb. 10	Mar. 6	·02
Con. Imperial, Nev.	30	Dec. 13	Jan. 13	Feb. 9	·05
Del Monte, Cal.	4	Jan. 5	Feb. 9	Mar. 3	·20
Hale & Nor., Nev	97	Jan. 7	Feb. 11	Mar. 4	·50
Head Center	2	Jan. 19	Feb. 19	Mar. 25	·05
Iron Hill, S. Dak.	19	Jan. 9	Feb. 11	Feb. 28	·03
Kentuck, Nev.	..	Dec. 29	Feb. 3	Feb. 25	·35
Locomotive, Nev.	..	Dec. 15	Jan. 22	Feb 10	·05
Lone Star Con., Cal.	2	Dec. 29	Feb. 7	Mar. 2	·00½
Milwaukee, Mont.	..	Jan. 22	Feb. 20	Mar. 12	·00½
N. Gould & Curry, Nev.	12	Jan. 10	Feb. 11	Feb. 28	·20
Potosi, Nev.	35	Dec. 16	Jan. 20	Feb. 10	·50
Sierra Nev., Nev.	98	Jan. 2	Feb. 5	Feb. 24	·30
Union Con., Nev.	42	Jan. 5	Jan. 10	Mar. 2	·25
Utah Con., Nev.	11	Dec. 9	Jan. 19	Feb 9	25

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, Salt Lake City, San Francisco, Baltimore, Denver, Kansas City, Minneapolis, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 185 and 186.

NEW YORK, Friday Evening, Feb. 6.

The New York mining stock market for the week ending the 6th inst. presents a phase for review which can be considered as decidedly encouraging, if not a fore runner of better times. Reference is made to a general rise in values of almost all the stocks quoted, the reappearance of a number of stocks which had temporarily disappeared from the exchange, a general inquiry for the better class of stocks, the disposition on the part of brokers to bid for a stock at a figure approximating its real value, the tendency of a stock to rise in value on the receipt of reliable news of a favorable nature, and last but not least, the marked advance of the Comstocks. It will not be hard to discover the cause for most of these encouraging tendencies. The mining stock market is very sympathetic. Financial situations affect it for better or worse. The present improved tone of Wall street securities, is having a beneficial effect. It must be added, however, that the sales for the week have not exceeded those of the previous week, and were confined to 39 stocks. As in weeks past quite a number of these have been "washed sales."

The steady, and as we believe healthy rise in Comstocks this week is doubtless attributed to the policy recently made known regarding the operation of the different companies, it being in effect that the lower levels of all the large mines are to be drained and operations resumed after an idleness in those portions for over six years. For further information concerning this see our column of Comstock mining news. As our readers are aware, work of unwatering the Gold Hill mines has been going on for several months, and recently John Mackay and others, who control the Middle and North end mines, have determined to begin pumping out the lower level. The combination shaft owned by the Chollar, Potosi, Savage and Hale & Norcross companies was shut down five years ago, leaving the lower levels to fill with water. The San Francisco stock market has naturally boomed under this stimulus, and the slow, sluggish pulse of the New York Mining Stock Exhange has commenced to quicken.

Of the Comstocks, California and Virginia was in active demand. It closed last week at $4, opened on February 3d at $5, ruled quite active and closed at $5.50 on very light sales. Crown Point followed in its wake, opening at $1.95 on Saturday, and closing at $2.30 to-day on very light sales. Ophir was one of the few who suffered a decline, it closed last week at $3.35, experienced one sale on Saturday at $2.75. Yellow Jacket on very light sales maintained its closing price of last week, it being $2.60. Alta lost five cents during the week, closing at 75c. on Tuesday; sales aggregated 500 shares. Bullion was in the market, the quotation being $3.20. Chollar experienced two sales during the week, the last being $2.45, a rise of 25c. over last week's price. Comstock tunnel was more active than it has been for some weeks. It opened at 16c., rose to 17c. on Thursday, and closed at 16c., sales amounting to 1,700 shares. Comstock bond was quoted this week for the first time in several months. It opened at 30c. and closed at 32c. on sales of 3,000 shares. Julia did not enter the market until Friday. It opened at 23c., selling in lots of 100 shares, and climbing to 27c., at which price it closed. Sales aggregated 3,000 shares. Mexican closed on Wednesday at $2.80, a gain of 5c. over last weeks closing price. Occidental was quiet during the fore part of the week, selling at 95c. on Wednesday and $1 on Friday, a gain of 20c. over last week's quotations. Potosi experienced one sale of 100 shares on Saturday at $5.38, again at 38 cents. Utah sold on Saturday at 90c. falling off to 85 c. on Monday. It was not quoted during the latter part of the week.

Eureka Consolidated of Nevada, which was quoted last during November, sold 100 shares at $2 on last Saturday.

Of the Colorado stocks, Adams sold on Wednesday at $1.80. S. White, Jr., informs us that this company has declared a dividend of 5c. per share, payable on the 10th inst., that the books close on the 3d and open on the 11th. The last dividend paid by this company was in January, 1887. Aspen has declared a dividend No. 21 of 10c. a share, or $20,000, payable on and after February 14th, to the stockholders of record. Transfer books close on February 11th and re-open February 16th. A notice of the dividend brought out 200 shares of stock at $6. The last sales of this stock were in October, the price being $6.50. Leadville Consolidated was in the market to the extent of 100 shares at 13c. American Flag sold at its customary price, 5c.; 700 shares changed hands.

Mutual Smelting and Mining was quite active on small sales. The opening price was $1.50; fluctuations amount to 5c.; the closing price was $1.45.

Of the Amador stocks Astoria sold 4,300 shares at 4c., the price which has ruled for several weeks. Middle Bar experienced 3 sales, aggregating 2,500 shares at 4c. Belmont remains the same at 31c.; 1,400 shares changed hands.

Brunswick opened at 9c. on Monday, rose to 14c. on Tuesday, ex-assessment, losing 2c. to 12c. on Wednesday, rising to 14c. on Thursday, and closing at 12c.; 6,600 shares changed hands.

The copper stocks, although experiencing very light sales, showed quite a marked improvement in prices. Atlantic sold 200 shares at $16.25 and $16.75, as against $14.13 of the week previous. Boston & Montana sold 30 shares at $42.13, a gain of $2.63. Calumet & Hecla sold 30 at $251.25. Franklin showed quite a marked improvement on sales of 50 shares, the price being $17.88, as against $16.25 of the week previous. Kearsage was in the market to the extent of 100 shares at $11.88. Huron sold at $3.38 and $3.13, the latter being the closing quotation; 300 shares changed hands.

Of the California stocks Plymouth opened at $2.45, steadily dropping on light sales until the figure of $2 was reached, it being the closing quotation. It will be remembered that this stock jumped from $2 to $2.50 on last Friday.

Standard experienced a sale of 200 shares at $1.45, a gain of 5 cents.

Caledonia sold 200 shares at 55c., last week's quotation. Deadwood 50 shares at 75c.

El Cristo was sold to the extent of 900 shares, the closing quotation was 65c., a gain of 15c.

Phœnix, of Arizona, was comparatively active. It opened at 60c. and closed at 58c., a loss of 6c. The sales aggregated 2,400 shares. Holyoke, a stranger on the exchange, ventured into the market to the extent of 300 shares, which were parted with at 5c.

Horn Silver regained its old price of $3; the sales aggregated 2,620 shares.

Moulton of Montana sold on Thursday to the extent of 200 shares at 39c.

Silver King experienced one sale of 100 shares at 20c.

Silver Mining of Lake Valley declared a dividend of 10%, payable on the 12th inst., the stock

holders' record on the 5th inst. at 3 P. M. The transfer books will be closed from the 5th to the 12th. The stock was not traded in during the week.

Boston. Feb. 5.

(From our Special Correspondent.)

There is a slightly better market for the copper stocks, although the transactions are as yet rather limited; but it is notable that there is more disposition to buy than to sell, and there are not many stocks in the market, most of the sales being in small lots. With a fairly easy money market, which seems to be indicated, there should be more activity and better prices. This may come later on, when the market for ingot becomes more settled, and the companies can be assured of a fixed price for their output for the coming year. Calumet & Hecla has been strong the past week, with quite a number of orders to purchase for investment, which carried price up $10, to $260. Tamarack also advanced from $145 to $150, and there are good buying orders yet unfilled. Osceola sold up from $36 to $38¼, but reacted to $36½. Boston & Montana has been only fairly steady, selling up to $42 for small lots and closing at $41. Atlantic sold up to $16½, an advance of $1¼. Centennial was a little more inquired for, and the good reports from the mine this week helped it up to $16½, with reaction to $15¾. Kearsarge was also better, on its improved outlook, and advanced on small sales to $12¾, a gain of $1¼. Franklin advanced to $17¾, but lost a portion of it, selling at $17, with later sales at $17½. Quincy declined from $105 to $85 ex-dividend $5, making a net decline of $15 for the week. The action of the directors in voting to give the 10,000 shares of stock in the treasury for the Pewabic property has caused some unfavorable comment, and doubtless is the reason for the decline. The boom in Santa Fe noted last week was short lived. The stock has settled down to 50c., and there is now very little doing in it. National advanced to $3¼, but lost the fraction in later sales, declining to $3. Bonanza was more active and sold up to 65c. Allouez has shown a good degree of firmness the past week. All the sales were at $2½, a rise of 50c., and the stock is in demand at that figure. Some of the small copper stocks are inquired for, and we note sales of Arnold at 47½c. and Hungarian at 25c. Silver stocks have been very dull during the week. Dunkin sold at 62½c.@65c., Catalpa at 35c., and Crescent at 15c.

There was no special feature in the market this afternoon, prices remaining about the same as in the morning.

By Telegraph.—Calumet, $260; Tamarack, $146 bid; Osceola, $38¼; Franklin, $17; Boston and Montana, $42.

Denver.

Prices and sales for week ending Jan. 31st, 1891.

Company.	Opening.	H.	L.	Closing.	Sales.
Alleghany, Colo	10½b	21½	18	21½	2,800
Amity, Colo	01⅜	04½	01¾	03⅜	8,200
Bangkok, C. B., Colo	05½b	06	05½	05¾	10,200
Bates-Hunter, Colo	57b	61	60	61	900
Brownlow, Colo	04¾b	*05½	05	05½	800
Calliope, Colo	22½b	22½	21¼	21	800
Cash, Colo	10b	13b	10b	13	.....
Clay County, Colo	79b	86	80	85	6,800
Hard Money, Colo	.....	.....	.....	.....	.....
Leavenworth	18½	23	18½	22½	1,500
Little Rule, Colo	100a	100	*95	100	3,800
Matchless, Colo	250b	400a	250b	250	.....
May-Mazeppa, Colo	119b	*128	120	121	1,700
Mollie Gibson, Colo	.....	.....	.....	.....	.....
Oro, Colo	100b	300a	100b	100	.....
Pay Rock, Colo	04b	04¼	04	03¾	10,800
Puzzler, Colo	.....	.....	.....	.....	.....
Reed-National, Colo	52b	60b	51b	60	.....
Running Lode	22	*22¼	20½	20½	1,900
Silver Cord, Colo	20b	24b	20b	20	.....
Whale, Colo	.....	.....	.....	.....	.....
Bal. Smuggler	35b	100b	35b	100	.....
Prospects.					
Argonaut, Colo	15b	18b	15b	15	.....
Aspen United, Colo	.....	.....	.....	.....	.....
Big Indian, Colo	12a	12a	*10b	.....	.....
Big Six, Colo	05½b	05¾	05	05½	2,500
Century, Colo	30a	20	20	.....	100
Claudia J. Colo	.....	05	04¾	.....	2,000
Nat. G. & Oil Co	09¾b	†12	*11	†12	1,400
Diamond B., Colo	01½b	04	01¼	04	9,200
Emmons, Colo	*43	*45	41	42½	7,100
Golden Treasure, Colo	15	16¼	15	16¼	3,600
Ironclad, Colo	01¾b	02½	02¼	02½	1,600
John Jay, Colo	02½	03¾	01¼	03¼	8,500
Justice	*14b	12½	12½	12½	500
Legal Tender, Colo	01¾b	05	02	04	8,400
Morning Glim, Colo	43b	45	45	45	100
Park Consolidated	*19b	*21	19½	19½	800
Potosi, Colo	04½b	09	05	06¼	27,400
Rialto, Colo	45b	60	50	60	1,300
Total					120,700

* Buyer 30. † Buyer 60. a Asked. ‡ Seller 60. b Bid. § Seller 30.

Chicago. Feb. 4.

(From our Special Correspondent.)

The Chicago Mining Stock Exchange has rented the spacious and admirably located quarters No. 13 Board of Trade court (Rialto Building, ground floor), and will begin business on or about March 2d, with from 8 to 10 good mines on their list. There will be two calls daily. The association has already over 60 members, and a number of brokers will undoubtedly subscribe at an early day, in order to take the advantage of the low fee of $100, which is limited to the first 100 members; the membership fee thereafter will be increased at a rate to be determined upon by the board of directors. Chicago speculators are much interested in this enterprise, and success is anticipated. A rigid examination of all mines offered will be made before any connection with the Exchange will be permitted, and sworn monthly reports of their affairs and work done is one of the conditions upon which they will be listed. "Prospects" will be accepted and listed as such, but only those that have withstood the closest investigation and warrant encouragement. The officers elected for the current year are: Barton Browne, president; V. A. Macdonald, vice-president; Daniel T. Jarvis, treasurer, and Berthold Friend, whose address is Room 85, 232 La Salle street, secretary.

St. Louis. Feb. 4.

(From our Special Correspondent.)

The market opens this month very poorly, and business is slack. There has been but a small amount of trading indulged in, and sales do not go much over 10,000 shares. The last few days of January showed up well, and over 21,000 shares of stock were reported as sold. Prices on the whole declined somewhat. At present the market is very dull.

The Granite Mountain declared its regular dividend of 50 cents per share. Its shipments this week amounted to 44 bars, containing 56,450 ounces of silver and 99 ounces of gold.

The market opened at $42.50, but soon declined to $42, its present quotation. On change 68 shares were sold, but it is reported that not a few sales are being made in private.

Central Silver was a favorite this month and had a steady demand. Opening at 08c., the market advanced as much as 04c., but later the stock fell to 11c. The number of shares sold amounted to 14,600.

At the beginning of the week Mickey Breen fell off a good deal to a very poor market, going as low as 77½c., but soon recovered its lost ground, and with an opening quotation of 80c. is now bid at 95c., and at one time was as high as 97½c. Sales, 3,000 shares.

Early in the week Tourtelotte had a sale of 1,000 shares at 2½c.

Elizabeth fell off 10c. this week, and is now quoted at $2.47½. During the week it went as low as $2.42½. The sales amounted to 2,400 shares.

Four Mile, the newly listed stock, sold at 23¾c., the opening price. Six hundred shares were sold. The market closed strong at 25c.

Gold King opened at 20c., but by the end of the week was bid at 15c. The week's business showed 6,600 shares as sold.

Montrose was another stock to be favored, and though only 500 shares of stock were sold, the market advanced 10c. on its opening and now holds firm at 67½.

One thousand shares of Silver Belle sold this week at 15c.

Yuma had a market at the beginning of the week, and, opening at 48¾c., 1,100 shares were sold, but though the price had an increase of 1¼c., and is now quoted at 50c. no trading was done.

Adams had a very unsteady market, the stock fluctuating between $1.60 and $1.75. No sales were made and the stock closed firm at $1.70.

Silver Age had a sale of 50 shares at $1.60. The opening quotation was at $1.50, went up to $1.60 and closed at $1.52½.

Little Albert fell off 1¾c., and is now quoted at 20c. Sales, 100 shares at 20c.

Aztec opened with a sale of 500 shares at 11½c., but the market has since rapidly declined to 8c.

Mountain Key had a sale of 100 shares at its closing price of 43¾c.

Bi-metallic was in big demand and the stock went up from $34 to $36.50. No sales.

American Nettie has advanced to 50c.

San Francisco. Jan. 29.

(From our Special Correspondent.

During the past week a measure has been sent to the Legislature, having for its purpose the enforcement of the provision of the constitution prohibiting the sale of stocks on margins. It also provides that no stocks shall be sold in buildings owned or occupied by mining companies, associations, etc. As the passage of the bill would practically annihilate the business of the Stock Board as at present conducted, it has not the remotest chance of becoming law, and on Pine street has only served to tickle the fancy of brokers and clients alike.

Last week ended with the stock market very dull, and prices inclined to give way to the weakening tendencies which made themselves felt in the absence of any strong operators who might sustain values. On Monday a stronger feeling was apparent, although trading continued somewhat dull, and the dealings were not large. On Tuesday prices began to move, and yesterday, and during the morning session to-day, stocks have had a lively rally with fairly large sales. The sales for the week past were as follows: January 22d, 8,270; 23d, 7,130; 24th, 3,710; 26th, 9,825; 27th, 11,595; 28th, 14,065.

It was believed by many that the arrival of J. W. Mackay on this coast boded good to the mining industry, and as a consequence would result favorably to stock interests. The only stocks, however, that have shown any exceptional strength until this morning have been Bullion, Overman and Caledonia, each of which sold at an advance of from 10 to 20 cents. To day, however, the plan for draining the Middle and North End Mines, described at length in the news columns, having been made public, the market at once responded to the exhilaration felt on the street, the North and Middle stocks advancing with heavy sales. Consolidated California & Virginia closed at $4.25, and opened this morning at $4.85, receding somewhat before the session closed. Best & Belcher sold at $3.10; Gould & Curry to $2.60, and Overman to $2.35. The new Kentuck stock was issued to-day and was called this morning for the first time and sold for 35 cents. Three and a half shares of the new stock are being exchanged for one share of the old issue, so that 35 cents is practically the equivalent of the price ruling during the week for the old issue.

PIPE LINE CERTIFICATES.

(Specially reported by Messrs. WATSON & GIBSON).

It is tiresome to continue to chronicle week after week the dulness and stagnation in the petroleum business. There is absolutely no speculative interest in it and when it will revive is a conundrum which nobody now undertakes to guess. We presume that the situation in the field both in Ohio and Pennsylvania after a while will become such that the market will break away from its pivot, of 75 to 80 for the Pennsylvania and 20 and 22 for the Ohio and assume some definite direction. When that period arrives there will doubtless be an active speculation, but that time cannot be forced by speculators; it must come through natural causes or the action of the Standard itself

Trust Stocks.

The National Lead Trust shareholders met in New York on the 4th inst. The following trustees were elected unanimously for three years, namely: F. W. Rockwell, W. H. Thompson, and R. R. Colgate; and L. A. Cole was elected a trustee to fill a vacancy until the first Wednesday in February, 1893. It was announced that the trustees had declared a dividend of 50 cents a share, payable April 15th. The second annual report of the trustees was made by Col. W. P. Thompson, president of the trust. He stated that at the date of the last report the capitalization was $89,447,000, for which certificates were outstanding. There has been no change in the capitalization since that time. The valuation of the property then was $22,361,900. The balance sheet for the fiscal year 1891 showed investments of a value of $24,217,638.61 in the stocks of the corporation, divided as follows: plant investment, $17,992,989.80; other investments, $459,234.79; working capital, $6,156,778.27; less mortgages to the amount of $391,364.24. Other net assets of the trust amounted to $910,785.80. The net amount expended for betterments during the year was $153,802.05; and net earnings, $2,028,552.23. At a meeting of the directors held on the 5th inst. the following officers were elected: president, Col. W. P. Thompson; first vice-president, Gen. A. T. Goshorn; second vice-president, F. W. Rock- well; secretary, L. A. Cole; assistant secretary, J. B. Nottingham, and Assistant Treasurer, L. S. Thompson. (The lead trust was editorially considered in the ENGINEERING AND MINING JOURNAL, July 20th, 1889.)

Electric Stocks.

Reports state that George Westinghouse, Jr., has placed 30,000 shares of preferred electric stock conditional on a total subscription of 40,000 shares. The date for subscriptions has been extended to February 15th.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, February 6.

STATEMENT of shipments of anthracite coal (approximated) for the ten days ending January 31st, 1891, compared with corresponding period last year:

Regions.	Jan. 31, 1891.	Feb. 1, 1890.	Difference.
Wyoming Region, Tons	370,143	252,092 Inc.	118,051
Lehigh Region "	95,649	1 1,958 Inc.	6,309
Schuylkill Region "	203,760	162,398 Inc.	41,362
Total Tons	669,552	516,448 Inc.	153,104
Total for year to date Tons	3,094,895	2,418,243 Inc.	676,652

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending January 31st, 1891, and year from January 1st, in tons of 2,000 lbs.: Week, 90,056 tons; year, 424,121 tons: to corresponding date in 1890—529,976.

PRODUCTION OF BITUMINOUS COAL for week ending January 31st and year from January 1st:

WESTERN SHIPMENTS.			
Pittsburg, Pa	20,382	111,866	81,953
Westmoreland, Pa	42,812	185,424	168,951
Monongahela, Pa	11,801	60,134	24,480
Total	74,995	357,424	275,384
Grand Total	438,691	1,680,868	1,754,574

EASTERN AND NORTHERN SHIPMENTS.

	1891. Week.	1891. Year.	1890 Year.
Phila. & Erie R.R.	3,451	15,223	13,578
Cumberland, Md.	†82,400	290,060	396,313
Barclay, Pa.	*3,263	13,650	9,509
Broad Top, Pa.	15,412	54,652	54,296
Clearfield, Pa.	91,115	419,343	393,960
Allegheny, Pa.	26,935	114,680	103,492
Beach Creek, Pa.	*45,372	220,099	149,710
Pocahontas Flat Top	42,577	188,007	170,287
Kanawha, W. Va.	†53,171	111,720	178,015
Total	363,696	1,323,444	1,479,190

* Estimated.
† Week ending January 24th.

The following statistics of the Cumberland coal trade are taken from tables compiled by the Cumberland and Pennsylvania Railroad Company:

PRODUCTION FOR THE YEAR 1890.

Name of Producer.	Total, tons.	Inc., tons.
Consolidation Coal Co.	956,031	84,568
American Coal Co.	386,731	89,194
Maryland Coal Co	366,839	98,401
George's Creek Coal and Iron Co.	351,310	40,052
Borden Mining Co.	290,055	83,506
New Central Coal Co.	218,169	99,284
Potomac Coal Co.	217,232	12,020
Barton & George's Creek Valley Coal Co	175,838	52,409
Franklin Consolidated Coal Co.	66,644	*5,193
National Coal Co.	60,206	*12,365
Big Vein Coal Co. (Md.)	52,917	31,607
Swanton Mining Co	41,401	653
Piedmont-Cumberland Coal Co.	29,093	26,510
Union Mining Co.	17,933	14,199
Atlantic and George's Creek C. C. Co. (Md.)	752	*3,132
Davis & Elkins Mine (Md.)	.....	*18,089
Anthony Mining Co.	115	115
George M. Hansel	.....	*113
Enterprise Mine	11	*277
North Potomac Basin:		
Elk Garden Mines	409,418	57,488
Davis Coal & Coke Co	176,243	67,647
Davis & Elkins Mine (W. Va)	75,914	55,458
Atlantic & George's Creek C. C. Co. (W. Va.)	64,230	510
Thomas Mine	43,136	14,771
Virginia Coal and Coke Co.	5,909	3,465
Spring Garden Coal Co.	84	*973
Total	4,006,691	792,205

* Decrease.

OUTPUT BY YEARS.

	Tons.		Tons.		Tons.
1842	1,708	1859	724,354	1876	1,835,081
1843	10,082	1860	788,959	1877	1,574,339
1844	14,890	1861	269,674	1878	1,679,322
1845	24,653	1862	317,634	1879	1,730,709
1846	29,795	1863	748,345	1880	2,136,160
1847	52,940	1864	657,996	1881	2,261,918
1848	79,571	1865	903,485	1882	1,540,466
1849	142,449	1866	1,079,331	1883	2,544,173
1850	196,848	1867	1,193,822	1884	2,934,979
1851	257,679	1868	1,330,443	1885	2,865,974
1852	334,178	1869	1,882,669	1886	2,592,467
1853	533,979	1870	1,717,075	1887	3,375,796
1854	659,681	1871	2,345,153	1888	3,671,067
1855	662,272	1872	2,355,471	1889	3,213,886
1856	706,450	1873	2,674,101	1890	4,006,091
1857	582,486	1874	2,410,895		
1858	649,636	1875	2,342,773	Total	66,643,885

Anthracite.

The cold wave made its appearance about the time that the operators joined hands over their recent disagreement and had pledged individual support in maintenance of a fair market. The two have been the only features breaking the monotonous quietude that has prevailed throughout anthracite coal trade circles during the week. During the week the market has been about as was predicted in our last week's report. The exact situation, as printed exclusively in the ENGINEERING AND MINING JOURNAL, set forth the sentiments of the great majority of the men of the trade. So far as has been learned—and we have it from the most authentic of sources—not one of the sales agents has exercised the alternative granted him by the association, *i. e.*, giving notice that he would not adhere to the schedule of restricted outputs. Consequently producers may be said to be united on this all-important point. The agreement will be carried out to the letter this month. This will have the effect of throwing the trade back into a normal condition. However, as stated in our last issue, this reserved capacity of the operators is a constant menace, there being a tendency to go beyond the limit,—or in other words, to mine more coal than there is a market for. Buyers are of course aware of this fact, and in consequence thereof are, at just this period, "shy" on the market. They are holding off, hoping to benefit themselves by a stampede of the companies. The wise heads of the trade say that the manner in which the companies have started to carry out the agreement by restricting production along all lines—coupled with seasonable weather, will soon place the trade where its immediate future will be beyond an uncertainty. We look for a gradual improvement during the balance of the month.

The case of Haddock, Shank & Co. vs. the Delaware, Lackawanna & Western Railroad Company, before the Interstate Commerce Commission, is answerable during the ensuing fifteen days. It is thought that it may be brought to a hearing before the majority of the 1890 transportation contracts expire.

Bituminous.

The soft coal trade is much easier this week than it has been at any time since the year opened. Not only has its condition improved, but the causes which brought about this effect continue in operation. During the week several large barge loads of bituminous coal have arrived. Contracts are beginning to expire, and the coal is purchased quite freely in the open market. Expiring contracts, it is said, are being quite generally renewed by those on the inside, at last year's prices. This action would seem to indicate the belief of these contractors to be that railroad rates for 1891 will not be changed.

The Pennsylvania Railroad Company is using its coke cars to transport coal. This is an almost unprecedent action on the part of the company, and will result in hauling a great quantity to tide water. With supplies moving freely, plenty of coal mined, and large numbers of furnaces and coke ovens shutting down, it looks as if the market would be crowded to the opposite extreme to the one against which it has been contending during the past month.

Advices reach us from the Clearfield region that a minority of the miners are not satisfied with the way the Rev. Mr. Dill settled the pending strike (see ENGINEERING AND MINING JOURNAL, January 31st). The majority, however, stand by the terms of the arbitrating committee.

The Grand Trunk Railroad advertises that it will place its orders for 700,000 tons of coal on the 10th inst. The operators have entered into a combine by adopting a scale which, if accepted, will give them about 25 cents more per ton than they received last year. Anticipating that the railroad company will hold out for last year's prices, these operators express themselves as determined to pull together.

The labor situation in the Connellsville coke region is becoming serious. A conference was held between the coke operators and miners on the 3d inst. without any settlement of the wage question. The operators demand a reduction of 10%. The miners' committee, which had instructions to demand an advance, made several proposition to the operators in the interest of peace. The operators refused every proposition, and the miners received orders to quit work on the 7th inst. for an indefinite time. The coke drawers will quit work a few days later. All the operators except W. J. Rainey were present. The first proposition of the miners was to agree on a scale, between the existing scale and the one demanded some weeks ago, which asked 12½% advance. To a reduction the miners refused to submit. The second proposition made to the operators by the miners was that work be continued at the present scale of wages until March 1st, as by that time a settlement might be reached. This the operators refused to agree to. The conference adjourned without setting a date for another session.

Those who are in touch with the labor agitators and the different managements of this district say that there has been a good deal of bluffing on each side. The demand of the operators, that wages be reduced 10%, in face of the men's demand of a raise of a similar per cent. was made in order that a compromise, based on present wages, could follow, and that upon February 7th, instead of a strike, the matter will again be postponed.

February prices for Connellsville coke have been fixed as follows: Furnace, $1.90; foundry, $2.30; crushed, $2.65. The price of mountain coke remains the same as last month. All contracts are made subject to strikes. The production of the Connellsville region for the week ending the 31st was 87,000 tons, a falling off of 3,000 from the previous week's production. Prices for bituminous range as follows: f. o. b. Philadelphia, $2.85; Baltimore, $2.85; New York, $3.25 and $3.50.

NOTES OF THE WEEK.

The drawing of colliery prices on anthracite coal on which miners' wages are to be based in the Schuylkill region was $2.33·9 in January, against $2.35·1 in December, and $2.37·5 in January, 1890. The wages will be 5% below the basis. It is believed that the January prices in the Schuylkill region average below those drawn, and in any event they indicate a less favorable condition of the trade than was prevalent in December.

A scheme is on the tapis in Chicago trade circles which is worthy of consideration because of its colossal proportions. It is nothing more nor less than a plan to consolidate the big coal companies of that city into a gigantic syndicate for the purpose of controlling the coal trade of the West. To further this end it is proposed to purchase a tract of 300 acres of land on the lake shore, in South Chicago, at a point easy of access to all the railroads entering the city, and to construct docks and warehouses thereupon.

At the annual meeting of the stockholders of the Maryland Coal Company held this week 35,865 out of 42,000 shares were represented. The financial statement showed net earnings of the year to be $96,304. The company purchased in open market for the purpose of cancellation 2,000 shares of its stock and 5,000 of its first mortgage 7% bonds. The company paid a dividend of 1½% upon its stock upon December 15th, 1890. John E. Knapp was re-elected president. The following constitute the board of directors: Henry J. Janes, George L. Kingsland, T. J. Robinson, Nicholas Roth, J. J. Wendel, Jos. E. Knapp, James W. Loveridge, Geo. P. Bangs, A. M. Brown and G. A. B. Hill.

It is stated that the Reading management is thoroughly in accord with President McLeod's policy in the retirement of the Reading Company from Port Liberty to Perth Amboy. Further, that it is urging the construction of an extension from Bound Brook to Perth Amboy. It is stated that the cost of such a line would be less than $1,500,000, instead of $3,000,000, as reported. President McLeod is quoted as having said that there is no better place than Port Reading from which to handle coal for distribution to New York and New England points.

The firm of Dickson & Eddy, 1 Broadway, representing the New York, Ontario & Western Railway Company, has just completed extensive dockage facilities at Weehawken, N. J., and is now doing a harbor business.

The Philadelphia *Press* states coal shipments in 1889 and 1890 to have been as follows:

	1890.	1889.
Reading	7,527,600	7,128,694
Lehigh Valley	6,768,496	6,504,118
Jersey Central	5,165,640	6,021,596
Del., Lack. & Western	5,792,769	5,502,045
Delaware & Hudson	3,674,800	3,812,779
Pennsylvania R. R.	4,017,600	3,884,976
Pennsylvania Coal Company	1,428,485	1,335,974
Erie	1,029,785	1,217,528
Total	35,855,174	35,407,710

Boston. Feb. 5.

The demand for anthracite coal is small, although dealers continue hopeful. When an order appears there is some pretty lively bidding to capture it, and buyers are being favored on all sides. The retailers are induced to buy in a small degree by the favorable market, and their small orders practically constitute the business passing. The large offerings do not tend to help the situation; and were it not that the outlook for the coming month is very promising, agents would have good cause to be gloomy. Those who are in possession of very large stocks are inclined to force matters a little, and consequently are not holding up to the circular price. Stove coal, at the best, will not command better than $4.25, and much is being moved at $4.

Bituminous coal continues to arrive fairly fast. The tone of the market is considered to be decidedly weaker. There is but little demand, and those in possession of large stocks are becoming a trifle anxious. They do not let an opportunity to sell pass through their hands. The gas coal situation is unchanged. None of the heavy buyers have been heard of in the market as yet and no large contracts have been made.

Freights continue quiet, but rates manage to hold up fairly well. From New York, 75@85c. is quoted; from Philadelphia, $1.25@$1.35, and from Baltimore, $1.20.

Retailers are doing a seasonable business, the weather being extremely cold. Most all the dealers are in a position to enjoy the demand, as they have large stocks on hand, and all the coal they could desire is available. The Coal Exchange prices prevail, as a rule, and a comparatively small amount of shading is being done.

The receipts of coal at this port for the week ending January 31st were 18,246 tons of anthracite and 21,920 tons of bituminous, against 19,857 tons of anthracite and 12,077 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 88,795 tons of anthracite and 79,078 tons of bituminous, against 88,102 tons of anthracite and 62,632 tons of bituminous for the same time last year.

Buffalo. Feb. 5.

(From our Special Correspondent.)

There are no exchanges in quotations in this market to note and few incidents worth recording. Reports of the stocking up of anthracite coal and the suspension of mining operations by some of the large companies, as well as of the idleness prevailing among a few of the small individual operators, have been prevalent for several days, and are now confirmed by news from reliable sources. It was apparent that the demand for coal was limited in comparison to the output, and, therefore, a restriction of production was ordered, with the assurance that the agreement will be faithfully adhered to.

The bituminous coal trade is good and prices fully maintained, with supply keeping close to demand, and but little over from day to day.

Work on the Buffalo & Geneva extension of the Lehigh Valley Railroad is progressing rapidly, and on the Geneva & Van Eltenville satisfactory work has been done. Some portions of the latter-named line will be resurveyed, looking to contemplated change in route to lessen curves between Sayre and Van Eltenville.

The Lehigh Valley Coal Company shipped from its collieries and by tenants during the year 1890 3,964,071 tons of coal, as compared with 3,830,505 tons in 1889 and 3,706,685 tons in 1888.

Another ore, coal and lumber dock is to be constructed by spring on Canal No. 3 of the Lehigh Valley company's property at this port. The length of the dock will be 1,000 feet.

It is said that the pay roll last month of the Bell, Lewis & Yates Mining Company at the Reynoldsville mines was $31,000. These mines are only a portion of the company's coal property.

The Helvetia Coal Mining Company have commenced taking coal from three drifts, but the quantity thus far mined is not large.

Chicago. Feb. 4.

(From our Special Correspondent.)

Some little improvement in the demand for anthracite is noted, owing to decreased country stocks. Trade is considered to be in a healthy and natural condition, but buying is confined to actual requirements, which will largely increase in case the present severe weather continues; in fact, the market is not provided for any long continuance of this extreme cold. Trade has been dull, but prices have been generally well maintained, and are likely to become firmer, as stocks are low, and an increased demand is probable.

Wholesale prices are f.o.b. Chicago: Large egg, $5.50; small egg, range and chestnut, $5.75; Lehigh lump, $7.

The retail prices fixed by the Chicago Coal Exchange are: Large egg $6.75, small egg, range and chestnut, $7.

Bituminous coal is in fair demand for manufacturing and industrial purposes, and is being supplied regularly, but stocks in hand are very low. Prices are steady, and no changes are looked for until March. Quotations per ton of 2,000 pounds are: Erie, $4.25; Pittsburg, $3.40; Indiana block, $2.50; Blossburg, $3.90; Greene and Sullivan County (Ind.) shaft, $2.25@$2.40; Jackson Hill, $3.50; Jackson shaft, $3.50; Hocking Valley, $3.20; Youghiogheny, $3.40.

The talk of a general strike among the cokers, still continues, and large buyers are making every effort to accumulate stock. Wages are very low; and in view of the position taken by all parties, a strike seems almost certain. However it could not be inauguarted at a better time to suit the operators. The demand for coke is only one-half the capacity of the region and, if Eastern furnaces shut down also, as they threaten to do, one-fourth of the remainder will be cut off. Quotations are: Connellsville, 72 hours, $5.05; domestic, crushed, $4@$4.25; Elk Lick, 72 hours, $4.25@$4.50 per ton of 2,000 pounds f. o. b. Chicago.

Pittsburg. Feb. 5.

(From our Special Correspondent.)

Coal.—The river mines continue closed, and both sides are firm. There has been no coal loaded for shipment during the past week and the canals are filled with empty barges, where they will remain until an arrangement is made between the coal men and the miners. The outlook is not very favorable. The local coal trade is improving on account of the growing scarcity of natural gas. Prices of coal at Pittsburg, wholesale, f.o.b., are $4.50@$5 per 100 bushels. Railroad coke, $5@$5.50.

Connellsville Coke.—Trade shows little change. The anxiety of furnacemen to increase their stocks will be continued until the 10th. Furnacemen have been stocking coke for some time. The Edgar Thompson Works are said to have 100,000 tons stored. Others also have large amounts. The active ovens are estimated at about 10,000; idle, 6,150; week's shipments were: To Pittsburg and river points, 1,900 cars; east of Pittsburg, 1,283; west of Pittsburg, 2,020; total shipments aggregate 93,654 tons; Pittsburg shipments increased 105 cars.

Price of coke:

New rates.		Founders	2.30
Furnace	$1.90	Crushed, dealers	2.50
Dealers	2.15	Crushed, consumers	2.65

Freights are unchanged to all points.

FREIGHTS.

From Philadelphia to: Boston, .95@1.15; Charleston, 1.40; Galveston, 2.25; New Bedford, .75.; Newburyport, .95; Providence, .75; Washington, † .85; Wilmington, 1.00.

† Alongside.

METAL MARKET.

NEW YORK, Friday Evening, Feb. 6.

Prices of silver per ounce troy.

Jan.	Sterling Exch'ge.	Lond'n Pence.	N. Y Cts.	Feb.	Sterling Exch'ge.	Lond 'n Pence.	N. Y. Cts.
31	4.87	46⅞	1.02	4	4.87	46¾	1.02⅛
Feb 2	4.8	46⅛	1.01⅛	5	4.87	46⅝	1 02¼
3	4.87	46¾	1.01¾ / 1.02	6	4.87	46⅝	1.01⅛

Council bills showed a decline of 8s. 16d.

Owing to the uncertainty of silver legislation at Washington the market has been a waiting one this week, and, consequently, has been without special activity. Silver has ruled dull but firm from 101⅛ to 102¼, but closes weak, on account of the unfavorable action of the Coinage Committee of the House.

The United States Assay Office at New York reports total receipts of silver for the week to be 131,000 ounces.

Government Silver Purchases.

The Treasury Department informs us that the amount of silver purchased by the Government during the past week was as follows:

	Offered, ounces.	Purchased, ounces.	Average prices.
February 4	1,132,500	478,000	1.0268

WASHINGTON, Feb. 6—(By Telegraph)—The Treasury Department purchased 507,000 ounces of fine silver to-day.

Silver Bullion Certificates.

NEW YORK STOCK EXCHANGE.

	Price. H.	Price. L.	Sales.
Jan. 31	102¾	102⅛	11,000
Feb. 2	102⅛	101¼	216,000
Feb. 3	102⅝	102	140,000
Feb. 4	104⅞	102¾	141.000
Feb. 5	102¾	102⅛	89,000
Feb. 6	102½	101¼	130,000
Total sales			727,000

Coinage at the Mints of the United States.

The following statement shows the coinage executed at the mints of the United States during January:

Denomination.	Pieces.	Value.
Double eagles	125,000	$2,500,000.00
Eagles	10,000	100,000.00
Half eagles	24,000	120,000.00
Standard dollars	3.585,000	3,585,000.00
Half dollars	4,800	2,400.00
Quarter dollars	88,000	22,000.00
Dimes	445,362	44,536.20
Five cents	1,876.000	93,800.00
One cent	4,100,000	41,000.00
Total minor	5,976 000	$134,800.00
Total coinage	10,258,162	$6,508,736.20

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .78	$ .80
Mexican dollars	.79	.80
Peruvian soles and Chilian pesos	.73	.75
English silver	4.80	4.84
Five francs	.94	.95
Victoria sovereigns	4.85	4.88
Twenty francs	3.84	3.88
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	1.01⅛	1.02⅛

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its minimum rate of discount which remains at 3%. In the week the bank gained £147,000 bullion, and the proportion of reserve to liabilities was raised from 45·56% to 45·77%, against an advance from 43·12% to 44.20% in the corresponding week last year, when its discount rate was 6%.

Copper.—The aspect of the market has not undergone any marked change since last reported, and probably will not until prices have definitely settled at that point which is gene ally expected. The disposition on the part of manufacturers to supply their immediate and future wants is, however, a little more pronounced, and if the rumor that about 5,000 tons Lake have been sold for export proves true, it is not unlikely that we shall soon see the situation become clearer, for it cannot be disputed that if the mining companies have relieved themselves sufficiently to feel more confident, they will be better able to sustain their point, and hold out for that price at which they are inclined to contract.

Consumption is gradually improving, especially in that line where copper is used for electrical purposes. The quotation for Lake copper is nominally 15c., but some transactions for small lots from second hands have taken place at 14½@14¾c. Such orders, as had to be placed, for wire bars and cakes were booked by the companies at 15c. and nothing in that line can be obtained below that figure.

The London market after closing last week at £52 12s. 6d.@£52 15s. for spot, and £52 17s. 6d.@£53 for 3 months, experienced somewhat of a decline, the lowest quotation of the week being reached on Monday, when £51 15s.@£51 17s. 6d. spot and £52 2s. 6d.@£52 5s. three months, was quoted. To-day the market closes a little firmer at £52 2s. 6d.@£52 5s. spot, £52 12s. 6d.@£52 15s. three months.

The decline has been largely attributed to bear sales, and but a small part of the transactions is representing the realizations of holders of the metal. We quote: English Tough, at £56@£56 10s.; Best Selected, at £59@£59 10s.; Strong Sheets, at £65@£65 10s.: India Sheets, at £59@£59 10s.; Yellow Metal Sheets, at £5⅞.

The statistics for January show a decrease in the visible supplies of about 5,000 tons.

The exports of copper during the past week were as follows:

To Liverpool—	Copper matte.	Lbs.	
By S. S. "Berlin"	6,385 bags.	702,571	$50,000
By S. S. Fitzroy	3,046 bags.	322,667	25.000
By S. S. Cufic	5,488 bags.	601,693	42,000
To Liverpool—	Copper.		
By S. S. Fitzroy	90 casks.	112,000	14,000
To Antwerp—	Copper.		
By S. S. Conemaugh	407 pigs.	119,979	14,000
To Rotterdam—	Copper.		
By S. S. Maasdam	1 cask.	1,250	178
To Havre—	Copper.		
By S. S. La Britagne.	365 pigs.	106,384	14,000
" "	2 casks.	2,500	350

Tin.—The downward course which has been prevalent lately made somewhat further progress during the early part of the week, but a reaction set in a few days ago and a better tone has since prevailed, the market closing to-day at 20·15, the highest of the week. Consumption is very satisfactory, and consumers at large show a great deal of eagerness to supply their wants far into this year. We quote spot at 20·10; February, 20·10; March, at 20·10; April, at 20·15.

The London market opened on Monday at £89 12s. 6d.@£89 15s. spot, and £90@£90 2s. 6d. three months, and declined on Tuesday to £89 7s. 6d.@£89 10s. spot, £89 15s.@£89 17s. 6d. three months, which was the lowest point touched during the week. Since then the market has improved and closes to-day at £90 2s. 6d.@£90 5s. spot, £90 10s.@£90 12s. 6d. three months. The transactions have been on a very large scale, especially for three months tin, and the reason for this may be partly attributed to the fact that the Chinese people are in the habit of closing out as much as possible entering into the new year.

Lead.—The market has quieted down a little, the immediate demand having been satisfied, but the tendency remains firm. Very little is being offered by Western smelters, in fact, so little, that as soon as buying is resumed on a large scale the market is likely to advance. Stocks continue very light everywhere, and it is fair to assume that with the approaching spring there will not be sufficient to meet the consumptive demand. At the close there are buyers at 4·35c. and sellers at 4·40@4.45c.

St. Louis Lead Market.—Messrs. John Wahl Com. Co. telegraph us as follows: Lead apparently is once more on the down grade; increased offerings from all channels and only a limited demand have caused prices to decline from 4.17½c.@4.10c. at the close.

Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "The strong tone in the market early in the week has given place to considerable weakness, and values have declined to 4·15c. at the close, at which price there are few buyers, and general trade is very dull. Sales will not foot up 600 tons."

Spelter continues unchanged, some sales having been reported as low as 5c., delivered, New York, and we understand that contracts for the entire year have been taken at about 5⅛c.

Antimony continues steady, with an improved demand. We quote Hallett's at 16¾c., L X at 17¼c., Cookson's at 18½c.

Quicksilver.—No communications from the other side are at hand to change the tenor of this market. The lack of activity noted in our last issue continues, and prices are nominally the same. We quote £8 12s. 6d. for abroad and $48@$50 for here.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Feb. 6.

The iron market during the past week has presented no new features whatever. Business continues to be unreservedly dull, and the same uninteresting condition which has marked the trade for the past two months and more, still prevails. Indeed, there does not seem to be any influences stirring which are likely to make a change in the situation in the immediate future.

Reports from inland cities are extremely variable; from some we hear accounts of somewhat increased demand and more sales, and from others, reports of a weaker market and shading in prices. These differences are, of course, due to local conditions, but they illustrate the irregular state of the market at the present time. In New York, while prices are no stronger, they are certainly no weaker.

The normal amount of business for this time of the year is being transacted, but all buying is in comparatively small lots, and consequently of a hand-to-mouth character. Prices have undoubtedly about reached bottom, and can hardly go much lower; but consumers are apparently holding off, awaiting a still further decline, and no one cares to buy for any time ahead. We hear no reports of any shading in prices at the present time, however, and prices are firm at quotations.

American Pig Iron.—Foundrymen are sending in more orders than for some weeks past, but aside from these no one is buying in a way to make trade brisk. The shutdown in the Mahoning and Shenango valleys continues. An association of the ironmasters of this district is reported to have been effected upon the 31st ult., including all the furnaces and rolling mills of the valley. The valley furnacemen are still clamorous for cheaper coke and freight rates, the recent reduction on coke having been unsatisfactory, and it is not likely that their furnaces will be blown in again for some time. Prices remain unchanged, and we quote: Northern iron, No. 1x, $17.50@$18. No. 2x, $16.50@$17; Southern, No. 2x, $15.50@$16.50.

Scotch Pig Iron.—The market is very dull. There have been no arrivals during the past week, but a lot is now due. There is some talk of the Scotch furnacemen going back to work. This strike has been in progress since Nov. 5, 1890. Summerlee, Coltness and Dalmellington are out of the market, and we quote only on Eglinton, $20.50, and Carnbroe, $21.

Spiegeleisen and Ferromanganese.—The market continues very dull. There has been a trifle more inquiry for ferromanganese, but no real increase in business. We quote, nominally, for 20%

spiegeleisen, $28@$29; 80% ferromanganese, $63.50 @$64, at tidewater.

Steel Rails.—As the season progresses there is the usual increase in business from railway companies for the maintenance of roadbeds. The Pennsylvania Railroad Company has been in the market during the past week with a large order of rails for renewals. The price is held solid at $30.

Rail Fastenings.—Business is very dull. Prices remain unchanged from last week, and we quote: Spikes, 2·00c.; angle plates, 1·70@1·80c.: bolts and square nuts, 2·75c.; hexagonal nuts, 3·00c.; complete joint, iron and steel, according to weight.

Tubes and Pipe.—Business continues very good for this season of the year and shows signs of improvement. We quote discounts on carload lots as follows: 47½% on butt, black; 40% on galvanized; 60% on lap, black; 47½% on lap, galvanized; boiler tubes: 50% on all sizes; casing, all sizes, 50%.

Structural Iron and Steel.—The market is remarkably dull for the present time of year. There has been no change in prices, and we quote: Universal plates, $2.20; bridge plates, $2.15; angles, $2.20; beams, $3.10.

Merchant Steel.—The market is quite active, orders continuing to come in freely. It has shown a steady improvement during the past month. Prices remain, however, at the same point, and we quote: Best English tool, 15c., net; American tool steel, 7@8c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2·60c.; open-hearth spring, 2·60c.; tire steel, 2·60c.; toe calks, 2·60c.; flat file, 4½c.; mill file, 4½c.; taper file, 7c.; first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—The market is very quiet, with no transactions of importance to note. The price remains nominal at $23 for tees and $25 for doubles.

Wrought Iron Scrap.—The market is very quiet, and there are sales of nothing but small lots. We quote from $21@$22.

Chicago. Feb. 4.

(From our Special Correspondent.)

The general improvement in the Chicago iron market, before noted in these columns, continues. The great steel industries at this center are still comparatively idle, which is the only drawback to the apparent general prosperity. Manufacturers of some lines claim that they are not realizing cost on their output, and all prices are low.

Pig Iron.—The market shows a fair amount of activity, and fair-sized lots are reported sold to large consumers Prices have gained considerably in strength during the past week, and an early advance in quotations appears probable. Some furnace agents refuse to sell Lake Superior charcoal under $18.50, claiming that at that figure there is only a bare margin for profit, but consumers find no difficulty in securing all they need for present and future requirements at 50 and 75 cts. less. Demand for this grade and Ohio softeners is very quiet. For local and Southern cokes the market is fairly active, and prices have ruled so low that consumers have felt safe in laying in considerable quantities; in many cases duplicate orders have been refused, and in some instances an advance of 25 and 50 cents has been paid. Considerable quantities of No. 2 soft Southern iron have been sold, but foundry grades are to a great extent neglected. Makers of coke iron are rather pleased at the prospect of a strike among the Connellsville coke workers, if it only should last long enough to drive more furnaces out of blast, and to clean up large coke stocks now on furnace banks. Many furnaces are still pressed for money, and therefore willing to sacrifice values in order to effect sales, but bottom prices have probably been reached on most if not all lines.

We quote to-day for cash per ton of 2,240 pounds f. o. b. Chicago, for Nos. 1 and 2, Lake Superior charcoal No. 3, for car wheels, Nos. 4 and 5 for malleable, $18@$18 50; Lake Superior coke, Bessemer, $18.50; Lake Superior coke, Bay View No. 1, $15.50; No. 2, $15; No. 3, $14.50; Southern coke, No. 1, $16@$17; No. 2, $15.50@$16; No. 3, $14.5.@$15; Southern charcoal, $19@$19.50; standard Southern car wheel, $22@$24.5.; Ohio softeners, Hanging Rock, $18@$18.50; Jackson County, $18.25@$18.50; Hanging Rock, cold blast, $26@$28; warm blast, $23@$25; No. 1 Scotch, according to brands, $26@$27; American Scotch, $18.50@$19; Bay View Scotch No. 1. $18; No. 2, $17; Chicago Scotch, No. 1, $17; No. 2, $16; Emma Scotch, $18.50@$19; black band, Hubbard Scotch, $18.25; Hazelton, $18.50; Soft Silvery, $18; Wellston, No. 1, $18 75; No. 2, $18.25; Hamilton, No. 1, $19.25@$19.75; Norton, No. 1, $17.50@$18; Zanesville, No. 1, $18.75@$19.25.

Structural Iron.—Small orders continue to be the feature with dealers, and many such are coming in, particularly for prompt shipment. The mild weather up to this date has greatly stimulated building, which has progressed until now without interruption. For car lots f.o.b. Chicago, iron and steel angles, $2.30@$2.40; universal plates, $2.50; sheared plates, $2.50; tees, $2.80@$2.90; beams and channels, $3.20. Store prices are: Angles, $2 50@$2.60; tees, $2.90@$3, and beams and channels, $3.50@$3 70, according to quantity.

Bar Iron.—More inquiry is reported, and sellers claim to have their hands full. Low prices have been made on local iron for consumption at distant points, at $1.70@1.75, half extras for 100 ton lots, subject to shading for desirable orders. Valley mills continue to quote $1.60 at mill for delivery during the next ninety days. Dealers quote $1.90 rates, with extras for large lots and $2 for small orders. The Calumet mills have started up with many orders entered.

Black Sheet Iron.—Inquiry is improving for corrugated sheets. The $2.90 quotation at mill is fairly well sustained for No. 27; common, same gauge, is $2.80@$2.85. Demand from store is very quiet, and prices are easy at $3.30, with the usual advance for refined.

Galvanized Sheet Iron.—Business is very good, the demand is excellent; inquiries are increasing, and the general outlook for future trade is very encouraging. The jobbing trade and consuming manufacturers are buying heavily, but store trade is comparatively dull, yet as large this time as last year. Discounts remain unchanged at 62½% off on Juniata and 62½% and 5% on charcoal from store. Jobbing lots are quoted according to quantity ordered.

Merchant Steel.—Some large buyers are in the market for cheap steels to stock up, but expect to buy at very low prices. Tool steel is in fair demand also, and a reasonably good trade is reported. Prices remain about the same. We quote as follows: Tool steel, $7.75@$8; specials, $12@$25; open-hearth machinery, $3; Bessemer machinery, $2.50@$2.70; open-hearth spring steel, $2.75@$2.80; tire, $2.50@$2.60; toe calk, $2.70@$2.80; sleigh shoe, $2.40@$2.50; cutter shoe (T. & B.), $2.65@$2.70; crucible sheet steel, $7@$10; crucible spring, $3.75.

Nails.—The advance of 10 cents per keg on wire nails made by manufacturers, as reported last week, is being maintained, and quotations are $2.30 Chicago. Jobbers quote the same figure. Steel cut nails are in modest demand only at $1.85 in small lots from store.

Plates, Tubes, etc.—Demand is fair to good, with an increasing inquiry; prices generally rule firmer, but it is said mills are offering tank steel at very low prices, lower than those asked for tank iron. The tonnage of January compares very favorably with that of any month of last year, mill agents say. Quotations are: Tank iron, $2.70; tank steel, $2.90; heavy sheets from 10 to 14, $2.90@$3; steel sheets 10 to 14, $3.25@$3.50; shell iron, $3@$3.25; flange iron, $4@$4.25; flange steel, $3.50; shell steel, $3.25; boiler rivets, $4@$4.25; firebox iron and steel, $4.75@$5.50; boiler tubes, 4½ inches and larger, 52½%; 2 to 4 inches, 50%, and 1¾ inches and smaller, 45%.

Steel Rails.—The outlook for steel rails continues an improving one, although business is by no means brisk. Prices are firmer than they have been, although quotations remain about the same, $30@$31.50 f.o.b. Chicago, according to size of order. Some inquiries are reported for round lots.

Railway Track Supplies.—Trade is steady and quiet, made up of small orders. Prices remain easy. We quote: Iron fish plates, $1.95@$2; steel fish plates, $2@$2.10; bolts, square nuts, $3; hexagonal nuts, $3.08@$3.10; spikes, $2.20@$2.25; for large orders $2 may be quoted.

Scrap Iron.—Plenty of old material is offered by out-of-town dealers; the local trade reports a steady improvement in the demand, and low-priced material is in the strongest request. Prices are fairly steady.

We quote as follows: Country mixed scrap, $15.50@$16.50, according to condition; No. 1 mill, $14@$14.50; light wrought, $9@$9.50; horseshoes, $18@$19.50; axles, $24; cast machinery, $12; stove plates, $9.50@$10; borings, $8@$8.50; wrought turnings, $11.50; No. 1 railroad shop or forge, $20; track scrap, $19.

Old Wheels and Rails.—There is but little doing at present, but the prospect is considered good. Prices for old iron rails are held at $23 f.o.b. Chicago; steel rails are steady at $17; guards and frogs at $13. Old wheels are quiet at $17.

Louisville. Feb. 2.

(Special Report by Hall Bros. & Co.)

There has been a considerable increase in volume of business since last report, mainly in the line of special brands, where quality was the chief consideration, and on such irons full figures have ruled. There has been a fair run of orders for the cheaper grades also, at varying prices. We quote:

Hot Blast Foundry Irons.—Southern coke, No. 1, $14.25@$14.50; No. 2, $13.75@$14; No. 3, $13.25@$13.50. Southern charcoal, No. 1, $16.50@$17; No. 2, $16@$16.50. Missouri charcoal, No 1, $17.50 @$18; No. 2, $17@$17.50.

Forge Irons.—Neutral coke, $12.50@$13; cold short, $12.50@$13; mottled, $12@$12.25.

Car Wheel and Malleable Irons.—Southern, standard brands, $21@$22; other brands, $17.50 @$18. Lake Superior, $21.50@$22.50.

Philadelphia. Feb. 6.

Pig Iron.—The situation in pig iron can be summarized as follows: A great deal of business has been quietly done in all kinds at $17 to $18 for No. 1; $16 to $17 for No. 2, and $14 to as high, in some cases, as $15.25 for gray forge. While heavy buying has been done, future requirements are being covered only to a very limited extent. This covers the whole situation.

Foreign Material.—Offers were made to-day by buyers, but sellers refuse to accept.

Muck Bars.—Sales have been made at $26.50, and several thousand tons would be taken at that figure, but most makers want 50 to 75 cents more.

Steel Billets.—A large amount of business is hanging fire, so to speak, because of the unwillingness of buyers to run their offers above $28 or $28.25, though two parties will not pay over $27.75.

Merchant Bar.—Interior bar iron makers say everything is unsettled. Reductions in wages are being made, and so far accepted by the men. Prices are about 1·75c. for medium, 1·85c. for refined. There is not enough business to go around. Large car building orders will soon be placed.

Nails.—Nails are weak and dull.

Skelp.—Prices are $1.75 and $1.85. Not much business.

Wrought Iron Pipe.—A great deal of anticipated business has suddenly disappeared, and prices are liable to be shaded.

Plate and Tank.—Heavy orders have been placed at about $1.90 for ship, plate, and tank, and, it is also said, for bridge plate. Steel is 10 cents higher and business is good.

Structural Iron.—Angles and sheared plate orders have been accepted at very low prices this week. The market is unsettled. The outlook for immediate business is not good.

Steel Rails.—Rail makers think and say the business of the next six or eight days will run over one hundred thousand tons.

Old Rails.—Quotations were given to-day at $23.50.

Scrap.—Sales of No. 1 railroad were closed to day at $22.

Pittsburg. Feb. 5.

(From our Special Correspondent.)

Raw Iron and Steel.—The tone of the market is weaker, with no signs of improvement. Sales have been made at various prices, with reports that occasionally sales are made below quotations. At the present time business is very unsettled, as the great Monongahela coal strike is still going on and a coke strike is threatened to commence on Tuesday, the 10th, which, if it materializes, will call out about 15,000 men. Both sides are making extensive preparations to make a big fight. For January, 1890, the Monongahela miners were paid $348,930 for mining 11,631,000 bushels coal, which were forwarded to the lower markets. In January of the present year shipments reached only 3,630,000.

In February, last year, Bessemer iron sold for $23 cash, and gray forge $18; present prices, Bessemer, $15.50@$17.75; Gray Forge, $13.75@$14, with sales of other descriptions of iron and steel at similar reductions. Leading dealers have, as usual, widely different views in regard to the future; very few are willing to give their opinion, since the situation, actually unsettled, may be still further affected by the coke strike during the next three months. The stock of iron on hand is not large as regards certain descriptions, still the supply is fully up to the demand. Several barges loaded with pig iron intended for this market and Wheeling are now on the way. This description has to be shaded before sales can be made. There are always buyers provided the price is made to suit their views.

During the past ten days several round lots of Bessemer have changed hands for March, April and May delivery at very low prices. This would indicate that sellers are not looking for an advance in the near future. A leading broker remarked that better prices in proportion are now obtained in the Shenango and Venango valleys than in Pittsburg. This is something that does not often occur. Present prices are the lowest experienced for a long time; there are, however, strong reasons for believing that bottom figures have been reached, although there is no indication of an immediate improvement.

Some grades of iron have sold at about as low a figure as on record. Foundry grades have maintained prices better than most other descriptions. Steel slabs and billets hold their own; prices evidently have touched bottom. For muck bar, the demand has fallen off; sales slight at last week's figures. Steel wire rods are in fair demand at current rates. Scrap material dull; prices weak and lower. For steel rails, the demand is restricted, with a firm market. Old iron rails scarce; former prices maintained. In skelp iron, a good business was transacted. For bloom ends, the demand was less active; prices unchanged. As to ferro-manganese, we note sales of domestic at current rates.

Coke Smelted Lake and Native Ores.

3,000 Tons	Bessemer, March, April, May, at furnace	$15 60 cash.
2,000 Tons	Bessemer, February, March	15.50 cash.
1,500 Tons	Bessemer, February, March	15.60 cash.
2,000 Tons	Grey Forge, March, April	13.75 cash.
1,000 Tons	Grey Forge	14.00 cash.
750 Tons	Grey Forge, February, March	13.85 cash.
500 Tons	Mill Iron	14.00 cash.
300 Tons	Grey Forge	14.00 cash.
250 Tons	Grey Forge, at furnace	13.75 cash.
250 Tons	No. 2 Foundry	15.50 cash.
150 Tons	No. 2 Foundry	15.25 cash.
100 Tons	Silvery	16.00 cash.

Charcoal.

250 Tons	Cold Blast	26.00 cash.
100 Tons	Lake Superior Channel	20.00 cash.
75 Tons	Cold Blast	26.00 cash.

75 Tons No 3 Warm Blast	22.50 cash.
50 Tons No. 2 Foundry	22.50 cash.
50 Tons No. 2 Foundry	22.00 cash.
Steel Slabs and Billets.	
2,500 Tons Rod Billets, February, March	25.00 cash.
1,500 Tons Billets and Slabs	25.50 cash.
1,250 Tons Rod Billets	25 50 cash.
500 Tons Billets and Slabs	25.70 cash.
Muck Bar.	
1,000 Tons Neutral, February, March	27.50 cash.
750 Tons Neutral, " "	27.00 cash.
Steel Wire Rods.	
1,000 Tons American fives, February, March	37.50 cash.
500 Tons American fives, " "	37.75 cash.
Ferro-Manganese.	
300 Tons 80% Domestic, March	63.75 cash.
Steel Bloom Ends.	
1,500 Tons Bloom Ends, February, March	17.00 cash.
Old Iron Rails.	
2,000 Tons American T's, del. Youngstown, March, April	24.50 cash.
2,000 Tons American T's, del. Youngstown, March, April	25.50 cash.
Skelp Iron.	
500 Tons Narrow Grooved	1.72½ 4 m.
500 Tons Wide Grooved	1.75 4 m.
500 Tons Sheared Iron	1.95 4 m.
Scrap Material.	
300 Tons No. 1 W. Scrap, net	20.00 cash.
200 Tons " " extra net	21.00 cash.
400 Tons Old Car Wheels, gross	17.00 cash.
250 Tons W. Iron, Turnings, gross	14.00 cash.
300 Tons Cast Scrap, gross	14.25 cash.
200 Tons Cast Borings, gross	14.25 cash.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Feb. 6.

Although there are many indications which point toward a stiffening of prices in this market, no very large amount of business seems to have been done. In some few articles an active buying demand has developed, and, only partially satisfied, continues at this writing. 58% alkali has changed hands quite freely, and the supply is pretty well sold. New arrivals, not already contracted for, will find ready purchasers. The report of a reduction in the output of alkali and bleaching powder, which has been freely spoken of, has now been positively confirmed. It has already resulted in a firmer market, with sales at prices a shade higher than the ruling heretofore. The rumor concerning a combination of the nitrate interests in Chili has also had a tendency to make sellers a little more confident.

Caustic Soda, 60%.—The arrivals on contract continue fair, but the small amounts coming in for the market are not very readily sold, although sellers are firm. Some lots have changed hands at 3·35c., with prices for smaller quantities proportionally higher. Seventy and 74% has come in mostly on contract and dealers are pretty well sold out. The resolution of the committee of the Alkali Union, according to which production will be cut down 25%, has made the market firmer, but at this writing, however, prices show little change from our quotations of last week. Spot, when obtainable, sells at 3·12½@3·15c. 77%.—The available spot supply remains very small, although some has come in during the week, most of which went into second hands immediately. We quote 3·10@3·12½c. with this grade for shipment a little lower. The shipments for the past year from Liverpool are reported to have been 37,426 tons, showing an increase of 4,551 over 1889.

Carbonated Soda Ash, 48%.—Business has taken no new start as a consequence of the reported diminution in the Alkali Union production. Small sales continue to be made, arrivals in fair quantity are reported, and the price remains 1·60.@1·65c. High test, 58%, has been a little more lively than during the preceding week. No large stock is accumulating, and a somewhat increased demand is noted. We quote 1·55.@1·60c., with shipments ahead a little lower.

Caustic Soda Ash 48%.—The litte spurt noticed in our last issue has in part given place to inactivity, although some business, mostly of a jobbing character, has been reported. Values remain the same as last week, but sales of comparatively large lots ahead have been made at lower figures. We quote: 1.60@1.65c.

Alkali, 48%.—Sales of large lots are reported to us at 1·60@1·62½c., and stocks in this article seem pretty well sold up; 58% has been particularly active, and the demand continues strong; prices have ranged from 1·52@1·55c.

Sal Soda.—Sales in foreign goods have been reported to us at 1·07½@1·10c., but no business of any consequence is done at present on account of the action of domestic makers, who have reduced prices to very nearly 1c., and as a consequence, with unimportant exceptions, control the business. Dealers look forward to a re-establishment of the old prices, as it is not believed that the domestic product can be profitably handled at present figures.

Bleaching Powder.—Quotations remain the same as given last week. Some arrivals have been noted and a jobbing business of some size has been reported. The contemplated reduction in the output of the English Union Works has given increased firmness to this market and will probably result in higher values before long. At present we quote 1·67½@1·75c.

Acids.—The comparative activity which has characterized the early part of this year is on the wane, apparently due to the disposition among dealers to hold for higher prices. We quote acids as last week, per hundred pounds in New York and vicinity: Acetic, $1.65@$2.20; muriatic, 18°, 80c. @$1; muriatic 20°, 90c.@$1.10; muriatic, 22°, $1@$1.20; nitric, 40°, $3.25@$3.50; some dealers report nothing at all below $3.75, little selling below $4 and most as high as $4.25, or thereabouts. Nitric 42°, $3.50@ $4; sulphuric, 60°, 70c.@80c.; sulphuric, 66°, 75c.@ 90c. According to other reports, most 66° has been getting as high as $1.12½.

Fertilizing Chemicals.—This market is looking brighter, and with the approach of spring promises to show as gratifying an increase in the use of fertilizers as heretofore. The South Carolina phosphate miners, however, look forward with some uneasiness to the practical workings of an act which was passed by the legislature recently and which provides for a commission to take charge of the phosphate mining industry in that State.

The industry is conducted by two classes of capitalists, the miners and the manufacturers. There are now 26 mining concerns operating in that State, with an aggregate capital of $8,0..0,000. They put on the market annually about 60,000 tons of phosphate rock, valued at $6 a ton, which brings in a gross income of $3,600,000. This crude rock is shipped to all parts of the world, and is used in almost every State in the Union. Since the exhaustion of some of the foreign mines the demand for it abroad has greatly increased. German and French buyers deal very largely in this market, and an extensive trade has been built up lately with Hamburg and other European ports. Much rock is also sent from that port to Japan. The greater part of the output, however, is used by the mills in the vicinity of the mines. The river miners paid royalties into the State Treasury in the fiscal year ending August 31st, 1890, of $237,149.06. There are 19 manufacturing companies in South Carolina which make fertilizers from the crude rock, and employ a capital of $5,000,000. Their annual output of acid phosphate is 400,000 tons. About 200,000 tons of this is sold before manipulation, bringing on a low market about $11.50 a ton, or a total of $2,300,000. The remaining 200,000 tons of this is worked up into ammoniated fertilizers, and will produce 300,000 tons of the latter commodity. This is sold on a cash basis for $18 a ton, thus yielding a gross amount of $5,400,000. The annual business of the mills is thus seen to be about $7,700,000.

As the three State officers on the commission are men who have publicly avowed their antagonism to the existing phosphate regulations, the miners are naturally uneasy at the uncertainty of the prospect before them. We quote: Charleston rock, $7@$7.50, f. o. b. vessel; ground, $8@$11.50. Freights by sail from Charleston to New York, $2.75@$3 per ton.

The demand for sulphate of ammonia has been good. Gas liquor continues to find an easy market at 3·15@3·20c., while bone is quoted at 3·10@3·15c.

Muriate of potash.—Compared with the same season in former years business shows a most encouraging increase. Arrivals continue steady, and are well met by a consuming demand. Small quantities available for spot delivery are reported here. In the neighborhood of 250 tons have come in during the week, while the sales have aggregated fully 300 tons. A large amount is nearby and on the way. Prices remain the same, with the added freight due to ice: $1.82½ for New York; $1.85 for Philadelphia; $1.87½ for Southern ports, and $1.90 for Gulf ports.

Nitrate of Soda.—We are indebted to Mr. F. B. Nichols for the following interesting statistics issued under date of the 1st inst.:

	1891.	1890.	1889.	1888.
Stocks in store and afloat in Atlantic ports, January 15th, bags	46,021	59.334	88,677	73,554
Arrivals at New York	50,300	37,895	22 280	Nil.
	96,321	97,229	110,957	73,554
Previously reported, 10,102; total arrivals to date, 60,402; same time 1890, 72,175; same time 1889, 50,890.				
Stocks	68 497	80,705	73,832	59.635
				To arrive.
New York	60,497			194,500
Boston	Nil.			23,000
Philadelphia	8,000			46,000
Baltimore				17,000
	68,497	Hampton Roads		133,500
		For orders.		
	431,000	New Bedford		Nil.
		Charleston		17,000
		Savannah		Nil.
				431,000

Visible supply.... 499,497; same time 1890, 510,705.
" " 1889, 270,232.

Stocks with dealers in store and afloat here:

	1891.	1890.	1889.	1888.
Deliveries fortnight ending February 1st	27,824	16.524	37,125	13,919
Previously reported	6,035	26,672	25,933	26,010
Total deliveries to February 1st	33,859	43,196	63,058	39,929

1891.	1890.	1889.	1888.
Sales spot 1·77½@1·80	1·85@1·90	2·22@2⅝	2·07@2·10

Considerable business has been done during the last fortnight. The political situation in Chili is more serious than was supposed and the actuality of a blockade of the nitrate ports has caused many consumers to provide for emergencies. The sales of the fortnight reached nearly 50,000 bags spot and to arrive at 1.72@1.80c,

The combination of producers who have agreed to a suspension of production for five months of this year has also not remained without its influence on trade and will eventually cause higher prices if the producers are honest with each other.

Our list to arrive takes in April, May shipments, and includes the "Drot," previously reported in distress, but now on her way from Barbadoes. The quantity is accurate as to charters up to date, but most of the vessels with Hampton Roads option will be pointed to a direct port when sailing. The arrivals for the month were: "Jas. A. Wright," at Baltimore, and "Eudora," "Portland Lloyds," "C. G. Rice," and "Katahdin," at this port.

Brimstone.—Values have a decided upward tendency and sales have been made at figures higher than any mentioned last week. The demand continues and the supply remains small. Speculation in Sicily is said to be the cause of this increase in values and no forecast of the future can be made, although there is certainly a probability of still higher prices. Seconds, best unmixed are selling for $27, to arrive $26.50, with thirds from 75c. to 50c. lower.

NOTES OF THE WEEK.

Cable dispatches dated London, February 5th, state that the Chemical Union is on the point of inviting the public to subscribe £1,250,000 to enable the trust to complete its contracts with the vendors of chemical works. The *Times* to-day advises the public to hold aloof from the scheme.

HAMBURG, February 5th.—It is reported in commercial circles here to-day that the Chilian Government has prohibited the export of nitrates.

According to report a majority of the salt manufacturers of Michigan have agreed to reorganize and become members of the Michigan Salt Association in case 95% of those in the State can be induced to do so.

The soda factory of E. D. Church & Co., corner of Manhattan avenue and Ash street, Williamsburg, was almost completely destroyed by fire on the evening of February 5th. The structure was five stories high, built of brick and filled with inflammable material. Loss on the building is estimated at $50,000, on the stock $150,000.

Liverpool. Jan. 28.

(Special Correspondence by J. P. Brunner & Co.)

Our market for heavy chemicals is not active, but with milder weather here and on the Continent, inquiries are coming in more freely. Alkali companies have made no change in prices, except a reduction of 2s. 6d. a ton on salt cake at maker's works. Soda ash is strong, owing to scarcity. We quote: 48% caustic ash, 1⅝@1⅝d.; high test, 1⅝@1½d.; carbonated ash, 48% and high strength, 1⅝@1½d., according to brands Soda crystals quoted at £3 10s. and some makers fully sold for prompt delivery. Caustic soda more inquired for and business passing at full prices; no resale parcels offering at the moment. For prompt delivery, we quote: 60%, £10; 70%., £11 57s. 74%, £12 57s.; 76%, £13 57s. For contracts extending over six or 12 months, 57s. per ton less money would be taken, but no forward business reported. Bleaching powder held for £7, and American orders placed at this figure. Chlorate of potash in better demand at 5½s. per pound. Bicarb. soda selling at £7 per ton and upwards for one cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia improving, and £10 14s. 6d. to £11 nearest spot values for good gray 24% in double bags f.o.b. is asked here. There are some inquiries from the States, but not much actual business.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Feb. 6.

Conditions continue unfavorable for trade, and the little spurt which characterized the business of a week since seems to have died an ignominious death. Dealers started to bring in material, and the market was found too sensitive.

Bricks.—No more definite information has come in with reference to the impending labor troubles. Some of the largest makers on the exchange have, however, expressed themselves very positively on the matter, and it is probable that the Knights of Labor will be met with a most decided denial. Bricks have come in a little more freely than heretofore, and the end of this week finds stocks larger than for some time since. The market for pale is said to be particularly weak, probably because they arrived quite freely. We quote: Haverstraws, $6.25@$6.50 per M.; pale, $3@$3.25; Jerseys, $5@$5.50; $6.25@$7 for Staten Island and Long Island.

Lime continues to be scarce, with a demand that makes sellers quite confident and not at all anxious to sell. No arrivals of any consequence have been reported to us. We quote Rockland common, $1.10; finishing, $1.20; St. John common and finishing, 85c.@95c.; Glens Falls common and finishing, 90c.@$1.10.

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and Amount of last	Dividends. Total paid.	Dividends. Date & amount of last.
1	Adams, s. L.	Colo.	$1,500,000	150,000	$10	*		$555,000 Jan. 1887 .10
2	Alice, s. c.	Mont.	10,000,000	400,000	25	*		895,000 Dec. 1890 .05
3	Alma & Nel Wood C., g	Idaho	300,000	30,000	10	*		60,000 Jan. 1889 .50
4	American & Nettie, c.	Colo.		300,000				150,000 Nov. 1889 .10
5	Amy & Silversmith, s.	Mont.		341,419				247,530 Aug. 1887 .12½
6	Atlantic, c.	Mich.	1,000,000	40,000	25	$280,000 April 1875	$1.00	700,000 Feb. 1891 1.00
7	Argenta, s.	Nev.	10,000,000	100,000	100	335,000 July 1889	.10	40,000 Feb. 1880 .20
8	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*		600,000 Feb. 1891 .10
9	Aurora, L.	Mich.	2,000,000	100,000	20			155,000 Oct. 1887 1.37½
10	Badger, s.	Ont.	250,000	50,000	5			37,500 Mar 1890 .25
11	Bassick, g. s.	Colo.	10,000,000	100,000	100	*		400,000 Mar 1884 1.00
12	Belle Isle, s.	Nev.	10,000,000	100,000	100	190,000 Dec. 1889	.15	300,000 Dec. 1879 .25
13	Belcher, g. s.	Nev.	10,400,000	104,000	100	2,978,003 June 1890	.50	15,397,000 April 1876 1.00
14	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	120,000 Dec. 1889	.25	200,000 Jan. 1890 .10
15	Bi-Metallic, s.	Mont.	5,000,000	200,000	25			410,000 Jan. 1891 .35
16	Bodie Con., g. s.	Cal.	10,000,000	100,000	100	550,000 June 1890	.25	1,602,572 April 1885 .50
17	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*		520,000 June 1886 1.50
18	Boston & Mont., c. s.	Mont.	2,500,000	100,000	25	*		1,700,000 Feb. 1891 1.00
19	Breece, s.	Colo.	5,000,000	200,000	25	*		2,000 Feb. 1880 .01
20	Brooklyn Lead, L. s.	Utah	500,000	50,000	10			127,000 July 1887 .05
21	Bulwer, g.	Cal.	10,000,000	100,000	10	130,000 Aug. 1889	.25	175,000 Jan. 1884 .10
22	Bunker Hill & Sull.	Idaho	3,000,000	300,000	100	*		150,000 Oct. 1883 .06⅔
23	Caledonia, g.	Dak.	10,000,000	100,000	100	505,000 May 1885	.15	194,000 Oct. 1890 .08
24	Calliope, s.	Colo.	1,000,000	1,000,000				135,000 Dec. 1890 .00½
25	Calumet & Hecla, c.	Mich.	2,500,000	100,000	25	1,200,000		34,350,000 May 1890 5.00
26	Carbonate Hill, s. L.	Colo.	1,500,000	300,000	10	*		80,000 April 1884 .05
27	Carlisle, g.	N. M.	1,000,000	200,000	5			175,000 Dec. 1888 .12½
28	Castle Creek, g.	Idaho	100,000	100,000	1			51,000 Oct. 1883 .03
29	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*		270,000 May 1884 .10
30	Central, c.	Mich.	500,000	20,000	25	100,000 Oct. 1861	.65	1,950,000 Feb. 1890 1.00
31	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*		1,650,000 Dec. 1884 .25
32	Colorado Central, s. L.	Colo.	2,750,000	275,000	10	*		406,250 Aug. 1889 .05
33	Commonwealth, s.	Nev.	10,000,000	100,000	100	170,000 Nov. 1888	.50	20,000 Nov. 1890 .20
34	Confidence, s. L.	Nev.		24,960		328,884 May 1890	.75	199,680 April 1889 1.00
35	Cons. Cal. & Va., g. s.	Nev.	21,600,000	216,000	100	108,000 Jan. 1885	.20	3,466,800 April 1890 .25
36	Contention, s.	Ariz.	12,500,000	250,000	50			12,587,500 Dec. 1884 .25
37	** Cop. Queen Con., c.	Ariz.	1,400,000	140,000	10			210,000 Feb. 1889 .50
38	Crescent, s. L. g.	Utah	15,000,000	600,000	25	*		228,000 Oct. 1888 .03
39	Crown Point, g. s.	Nev.	10,000,000	100,000	100	2,425,000 Sept. 1889	.50	11,588,000 Jan. 1875 2.00
40	Daly, s. L.	Utah	3,000,000	150,000	20			1,800,000 Jan. 1891 .25
41	Deer Creek, s.	Idaho	1,000,000	200,000	5	*		30,000 Jan. 1889 .05
42	Deadwood-Terra, g.	Dak.	5,000,000	200,000	25	*		$1,000,000 Nov. 1887 .10
43	Derbec B. Grav., g. s.	Cal.	10,000,000	100,000	100	90,000 Dec. 1881	.10	240,000 Oct. 1890 .10
44	Dunkin, s. L.	Colo.	5,000,000	200,000	25	*		390,000 Oct. 1889 .05
45	Dunstone, g. s. L.	Mont.	1,000,000	200,000	5	*		6,000 Nov. 1888 .03
46	Eclipse	Colo.	100,000	100,000	1			30,000 Nov. 1887 .10
47	Elkhorn, g. s.	Mont.	1,000,000	100,000	5	*		186,875 Dec. 1890 .50
48	Empire L., g.	Mont.	500,000	100,000				70,500 Dec. 1887 .37½
49	Eureka Con., g. s. L.	Nev.	5,000,000	50,000	100	550,000 June 1889	.50	4,892,500 Oct. 1890 .25
50	Evening Star, s. L.	Colo.	500,000	50,000	10	*		1,458,000 Dec. 1889 .25
51	Excelsior, g.	Cal.	10,000,000	100,000	100	560,000 Sept. 1885	1.00	875,000 Oct. 1880 .25
52	Father de Smet, g.	Dak.	10,000,000	100,000	100	200,000 Nov. 1878	1.00	1,125,000 Dec. 1885 .20
53	Franklin, c.	Mich.	1,000,000	40,000	25	220,000 June 1871		960,000 Jan. 1889 2.00
54	Freeland, g. s.	Colo.	5,000,000	200,000	25	*		190,000 July 1886 .10
55	Garfield Lt., g. s.	Nev.	500,000	100,000	5			95,000 April 1888 .12½
56	Gould & Curry, g. s.	Nev.	10,800,000	108,000	100	3,988,800 Sept. 1890	.25	2,826,000 Oct. 1870 10.00
57	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000 Jan. 1890	.30	525,000 Jan. 1890 .30
58	Granite, s. L.	Idaho	500,000	500,000	1	*		28,400 Oct. 1889 .02
59	Granite Mountain, s.	Mont.	10,000,000	400,000	25			10,6 0,000 Feb. 1891 .50
60	Green Mountain, g.	Cal.	1,250,000	125,000	10	*		212,500 Nov. 1881 .07½
61	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,142,800 April 1890	.50	1,162,000 July 1888 .50
62	Hecla Con., s. g. L. c.	Mont.	1,500,000	30,000	50			1,500,000 April 1889 .50
63	Hel'a Mg. & Red, g. s. L.	Mont.	3,315,000	663,000	5	*		197,979 July 1886 .06
64	Holmes, s.	Nev.	10,000,000	100,000	100	370,000 May 1890	.25	75,000 April 1886 .25
65	Holyoke, g.	Idaho	200,000	200,000	1			27,000 Feb. 1883 .10
66	Homestake, g.	Dak.	12,500,000	125,000	100	200,000 July 1878	1.00	4,643,750 Jan. 1891 .10
67	Honorine, s. L.	Utah	500,000	250,000	2	37,500 April 1889	.05	37,500 Sept. 1887 .05
68	Hope, s.	Mont.	1,000,000	100,000	10	*		233,252 April 1888 .25
69	Horn-Silver, s. L.	Utah	10,000,000	400,000	25	*		4,200,000 Sept. 1890 .12½
70	Hubert, g.	Colo.	1,000,000	1,000,000	1	*		247,000 Dec. 1889 .00½
71	Idaho, g.	Cal.	310,000	3,100	100			5,235,900 Dec. 1889 5.00
72	Ideal, s. L.	Colo.	1,500,000	50,000	10			15,000 Oct. 1886 .05
73	Illinois, s.	N. M.	100,000	100,000	1	*		45,000 April 1889 .20
74	Independence, s.	Nev.	10,000,000	100,000	100	340,000 Oct. 1886	.20	225,000 Sept. 1879 .25
75	Iron Hill, s.	Dak.	2,500,000	250,000	10	134,000 July 1889	.03	156,250 Nov. 1887 .07½
76	Iron-Silver, s. L.	Colo.	10,000,000	500,000	20	*		2,500,000 April 1889 .20
77	Jackson, g. s.	Nev.	5,000,000	50,000	100	237,500 Nov. 1880	.20	55,000 June 1889 .10
78	Jay Gould.	Mont.	2,000,000	40,000	5	*		459,000 May 1890 .04
79	Jocuistita, L.	Mex.	2,500,000	250,000	10			1,200,000 Feb. 1885 .50
80	Jumbo, g.	Colo.	2,000,000	200,000	10			35,000 Oct. 1887 .02½
81	Kearsarge, c.	Mich.	1,250,000	50,000	25	190,000 Oct. 1887	1.00	100,000 Jan. 1890 2.00
82	Kentuck.	Nev.	3,000,000	30,000	100	406,930 Aug. 1890	.30	1,350,000 Dec. 1886 .10
83	La Platta, s. L.	Colo.	2,000,000	200,000	10	*		610,000 Sept. 1882 .30
84	Leadville Con., s. L. L.	Colo.	4,000,000	400,000	10	*		4,423,000 April 1889 .05
85	Lexington, g. s.	Mont.	4,000,000	40,000	100	*		609,000 Jan. 1885 2.00
86	Little Chief, s. L. g. s.	Colo.	10,000,000	200,000	10	*		125,000 Sept. 1890 .05
87	Little Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*		1,050,000 Mar 1890 .50
88	Little Rule	Colo.	500,000	500,000	1			110,000 Jan. 1891 .02
89	Mammoth	Utah	10,000,000	400,000	25	113,000	1882 .25	760,000 Jan. 1890 .10
90	Martin White, s.	Nev.	10,000,000	100,000	100	1,225,000 Oct. 1890	.25	140,000 Dec. 1886 .25
91	Mary Murphy, g. s.	Colo.	350,000	3,500	100	*		175,000 May 1888 5.00
92	Matchless, s.	Colo.	500,000	500,000	1	*		15,000 Feb. 1890 .00½
93	May Mazeppa.	Colo.	1,000,000	1,000,000	1			70,000 Dec. 1890 .01
94	Minnesotta, c.	Mich.	1,000,000	40,000	25	420,000 April 1886	1.00	1,820,000 Mar 1876
95	Mono, g.	Cal.	5,000,000	50,000	100	760,000 Sept. 1890	.25	12,500 Mar 1886 .25
96	Montana, Lt., g. s.	Mont.	3,300,000	660,000	5	*		2,489,675 Oct. 1890 .06
97	Morning Star, s. L.	Colo.	1,000,000	100,000	10			850,000 Dec. 1889 .20
98	Moulton, s.	Mont.	2,000,000	400,000	5	*		380,000 Dec. 1887 .07½
99	Mount Pleasant, g.	Cal.	150,000	150,000	1	*		150,000 Feb. 1887 .30
100	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500 June 1880	2.00	160,000 Oct. 1889 .20
101	Napa, q.	Cal.	700,000	100,000	7			400,000 Jan. 1891 .10
102	Navajo, g. s.	Nev.	10,000,000	100,000	100	500,000 April 1890	.15	365,000 April 1889 .10
103	New Guston, s.	Colo.	500,000	100,000	5	*		337,500 April 1890 .50
104	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½	*		30,000 Dec. 1885 .06⅔
105	Northern Belle, s.	Nev.	5,000,000	50,000	100	425,000 Jan. 1884	8.00	2,400,000 April 1883 .50
106	North Belle Isle, s.	Nev.	10,000,000	100,000	100	395,000 April 1890	.20	200,000 May 1888 .50
107	North Star, g.	Cal.	1,000,000	100,000	10			250,000 Dec. 1889 .50
108	Ontario, s. L.	Utah	15,000,000	150,000	100			11,600,000 Jan. 1891 .50
109	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,210,640 April 1890	.50	1,595,800 July 1882 1.00
110	Original, s. c.	Mont.	1,500,000	60,000	25	*		123,000 July 1888 .05
111	Oro	Colo.	500,000	100,000	5			60,000 June 1890 .20
112	Osceola, c.	Mich.	1,250,000	50,000	25	480,000 April 1876	1.60	1,447,500 Dec. 1890 1.50
113	Oxford, g.	N. S.	125,000	125,000		*		78,500 Sept. 1888 .02
114	Paradise Valley, g. s.	Nev.	10,000,000	100,000	100	57,000 April 1888	.15	150,000 April 1887 .10
115	Parrot, c.	Mont.	1,800,000	180,000	10			696,000 Sept. 1890 .10
116	Peacock, s. g. c.	N. M.	2,000,000	200,000	10	*		60,000 Nov 1886
117	Piumas Eureka, g.	Cal.	1,406,250	140,625	10			2,548,046 Oct. 1889 .37½
118	Plutus, g. s. c. L.	Colo.	2,000,000	200,000	10	*		30,000 Feb. 1886 .10
119	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*		2,200,000 Feb. 1890 .40
120	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100			1,705,791 Aug. 1890 1.50
121	" com., Q.	Cal.	5,700,000	57,000	100			643,867 July 1882 .40
122	Quincy, c.	Mich.	1,000,000	40,000	25	200,000 Dec. 1862		5,770,000 Feb. 1891 5.00
123	Republic, c.	Mich.	5,000,000	100,000	50	400,000 Dec. 1889	.30	4,312,587 June 1887 1.25
124	Richmond, s. L.	Nev.	1,350,000	54,000	25	*		99,785 Feb. 1880 .50
125	Ridge, c.	Mich.	500,000	20,000	25	219,939 Mar 1886	.50	585,000 Dec. 1890 .05
126	Robinson Con., s. L.	Colo.	10,000,000	200,000	50	*		100,000 Dec. 1882 .50
127	Robert E. Lee, s. L.	Colo.	10,000,000	500,000	20			4,460,000 July 1869 3.00
128	Savage, s.	Nev.	11,200,000	112,000	100	6,604,000 Nov. 1889	.50	7,500 April 1883 .01
129	Shoshone, g.	Idaho	150,000	150,000	1			1,568,145 April 1888 .12½
130	Sierra Buttes, g.	Cal.	2,225,000	122,500	10			102,000 Jan. 1871 1.00
131	Sierra Nevada, g.	Nev.	10,000,000	100,000	100	6,296,910 May 1890	.50	270,000 April 1889 .10
132	Sierra Nevada, s. L.	Idaho	1,000,000	1,000,000		*		40,000 May 1890 .02
133	Silver Cord, g. s. L.	Colo.	4,500,000	450,000	10			270,000 April 1889 .10
134	Silver King, s.	Ariz.	10,000,000	100,000	100	130,000 Nov. 1890	.30	1,950,000 July 1887 .25
135	Silver Mg. of L. V.	N. M.	500,000	500,000	1			325,000 Feb. 1891 .10
136	Silverton, g. s. L.	Colo.	2,000,000	200,000	10	*		50,000 Jan. 1881 .25
137	Small Hopes Con., s.	Colo.	5,000,000	250,000	20	*		3,162,500 Oct. 1890 .10
138	Spring Valley, g.	Cal.	200,000	200,000	1	50,000 Oct. 1886	.25	3,595,000 June 1889 .05
139	Standard, g. s.	Cal.	10,000,000	100,000	100	100,000 June 1890	.50	155,000 Nov 1881 .05
140	Stormont, s.	Utah	500,000	500,000	1	*		844,000 Dec. 1887 .20
141	St. Joseph, L.	Mo.	1,500,000	150,000	10	*		1,974,000 Dec. 1890 .02
142	Swansea, g.	Colo.	600,000	60,000	10	*		100,000 Nov 1881 .30
143	Tamarack, c.	Mich.	1,000,000	40,000	25	520,000 April 1885	3.00	1,670,000 Oct. 1890 4.00
144	Tombstone, s. L.	Ariz.	12,500,000	500,000	25	*		1,250,000 April 1882 .10
145	United Verde, c.	Ariz.	3,000,000	300,000	10	*		97,500 Feb. 1884 .10
146	Valencia M.	N. H.	150,000	1,500	100	*		41,250 April 1886 2.50
147	Viola Lt., s. L.	Idaho	750,000	150,000	5			272,500 Oct. 1887 .37½
148	Ward Con., s. L.	Colo.	2,000,000	200,000	10			20,000 Dec. 1889 .05
149	Yankee Girl.	Colo.	2,500,000	250,000	10			1,2 75,000 July 1887 .10
150	Yellow Jacket, g. s.	Nev.	12,000,000	120,000	100	5,508,000 Mar 1889	.50	2,1 48,000 Aug. 1871 1.50
151	Week City, L. s.	Mo.	55,000	11,000	5			4,400 July 1889 .10
152	Woodside.	Utah						25,000 Oct. 1889 .25
153	Young America	Cal.						175,000 1889 .10

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and am't of last.
1	Agassiz Cons., s. L.	Colo.	$2,500,000	50,000	$50	*
2	Allegheny, s.	Colo.	5,000,000	500,000	10	
3	Allouez, c.	Mich.	2,000,000	80,000	25	$737,000 Jan. 1890 .70
4	Alpha Con., g. s.	Nev.	3,000,000	30,000	100	112,500 Sept. 1890 .25
5	Alta, s.	Nev.	10,080,000	100,800	100	3,359,800 Sept. 1890 .50
6	Amador, g.	Cal.	400,000	200,000	2	*
7	American Flag, s.	Colo.	1,250,000	125,000	10	300,000 June 1887
8	Amity, s.	Colo.	250,000	250,000	1	
9	Angio-Montana, Lt.	Mont.	600,000	120,000	5	
10	Astoria, g.	Cal.	200,000	100,000	2	
11	Barcelona, g.	Nev.	5,000,000	200,000	25	*
12	Bechtel Con., g.	Cal.	10,000,000	100,000	100	173,500 Jan. 1883 .10
13	Belmont, s.	Nev.	5,000,000	50,000	100	735,000 April 1886 .10
14	Best & Belcher, g. s.	Nev.	10,080,000	100,800	100	2,279,275 Aug. 1890 .25
15	Big Pittsburg, s. L.	Colo.	30,000,000	300,000	100	*
16	Black Oak, g.	Cal.	3,000,000	300,000	10	*
17	Boston Con., g.	Cal.	10,000,000	100,000	100	170,000 Nov. 1883 .25
18	Bremen, s.	N. M.	5,000,000	500,000	10	*
19	Brownlow, s.	Colo.	250,000	250,000	1	
20	Brunswick, g.	Cal.	2,000,000	400,000	5	*
21	Bullion, g. s.	Nev.	10,000,000	100,000	100	2,790,000 Dec. 1889 .25
22	Butte & Boston, c. s.	Mont.	5,000,000	200,000		.25
23	Calaveras, g.	Cal.	500,000	500,000	1	*
24	Carisa, g.	Wy.	500,000	100,000	5	*
25	Carupano, g. s. L. c.	Ven.	200,000	100,000	2	*
26	Cashier, g. s.	Colo.	500,000	250,000	2	*
27	Charles Dickens, g. s.	Idaho	1,250,000	250,000	5	*
28	Cherokee, g.	Cal.	1,500,000	150,000	10	
29	Cholla, s.	Nev.	11,200,000	112,000	100	1,540,000 Nov. 1889 .50
30	Cleveland, T.	Dak.	1,000,000	500,000	2	*
31	Colchis.	N. M.	500,000	50,000	10	
32	Comstock, g. s.	Nev.	10,000,000	100,000	100	35,000 Mar 1887 .15
33	Con. Imperial, g. s.	Nev.	5,000,000	50,000	100	1,875,000 July 1890 .05
34	Con. Pacific, g.	Cal.	6,000,000	60,000	100	198,000 June 1890 .10
35	Con. Silver, s.	Mex.	5,000,000	250,000	10	
36	Crescent, s. L.	Colo.	3,000,000	300,000	10	*
37	Crocker, s.	Ariz.	10,000,000	100,000	100	150,000 June 1890 .15
38	Crowell, g.	N. C.	500,000	500,000	1	
39	Dahlonega, g.	Ga.	250,000	250,000	1	*
40	Dandy, s.	Colo.	5,000,000	500,000	10	
41	Decatur, s.	Colo.	2,500,000	500,000	5	*
42	Denver City, s. L.	Colo.	5,000,000	500,000	10	*
43	Denver Gold, g.	Colo.	300,000	60,000	5	
44	Durango, g.	Colo.	500,000	500,000	1	*
45	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000 Mar 1886 1.00
46	El Cristo, g. s.	U.S.C.	1,000,000	500,000	2	
47	El Dorado, g.	Cal.	1,000,000	250,000	4	*
48	El Talcoso, g.	U.S.C.	1,000,000	500,000	2	
49	Empire, s.	Utah	10,000,000	100,000	100	
50	Eureka Tunnel, s. L.	Nev.	10,000,000	100,000	100	*
51	Exchequer.	Nev.	10,000,000	100,000	100	865,000 July 1890 .25
52	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	81,500 May 1890 .25
53	Hogebic I. Syn., I.	Wis.	5,600,000	200,000	28	
54	Gold Cup, s.	Colo.	500,000	200,000	1	*
55	Golden Era, s.	Mont.	2,000,000	200,000	10	*
56	Gold Placer, g.	Colo.	5,000,000	200,000	25	229,314 Dec. 1885 .25
57	Gold Rock, g.	Cal.	1,000,000	500,000	2	*
58	Goodshaw, g.	Cal.	10,000,000	100,000	100	*
59	Grand Belt, c.	Tex.	12,000,000	120,000	100	
60	Grand Prize, s.	Colo.	900,000	300,000	10	
61	Great Remance, g.	U.S.C.	1,000,000	500,000	2	*
62	Gregory-Bobtail, g.	Colo.	550,000	550,000	1	*
63	Gregory Con., g.	Mont.	3,000,000	300,000	10	
64	Harlem M. & M. Co., g.	Cal.	1,000,000	200,000	5	
65	Head Cent. & Tr., s. g.	Ariz.	10,000,000	100,000	100	
66	Hector, g.	Cal.	1,500,000	300,000	5	45,000 Jan. 1889 .15
67	Highland, c.	Mich.	500,000	25,000	20	
68	Holywood, s.	Cal.	200,000	100,000	2	
69	Hortense, s.	Colo.	2,000,000	200,000	10	
70	Huron, c.	Mich.	1,000,000	40,000	25	280,000 May 1887 3.00
71	Iron, Gold & Silver, s.	N. M.	2,000,000	200,000	10	*
72	Ironton, I.	Wis.	1,000,000	40,000	25	
73	Iroquois, s.	Mich.	1,250,000	50,000	25	
74	J. D. Reymert.	Ariz.	10,000,000	100,000	100	
75	Julia Con., g. s.	Nev.	11,000,000	110,000	100	1,463,000 Jan. 1889 .10
76	Lacrosse, g.	Colo.	1,000,000	100,000	10	*
77	Lee Basin, s. L.	Colo.	5,000,000	500,000	10	*
78	Mayflower Gravel.	Cal.	1,000,000	100,000	10	585,000 Mar 1890 .56
79	Medora, g.	Dak.	250,000	250,000	1	
80	Mexican, g. s.	Nev.	10,000,000	100,000	100	2,791,960 Oct. 1890 .25
81	Middle Bar, g.	Cal.	400,000	200,000	2	*
82	Mike & Starr, s. L.	Colo.	1,000,000	200,000	5	*
83	Mollie Gibson.	Colo.	2,000,000	100,000	2	
84	Monitor, g.	Colo.	100,000	1,000,000	1	*
85	Mutual Mg. & Sm.	W'sh.	100,000	100,000	1	*
86	Native, c.	Mich.	1,000,000	40,000	25	
87	Neath, g.	Colo.	1,000,000	100,000	10	
88	Nevada Queen, s.	Nev.	10,000,000	100,000	100	200,000 Oct. 1889 .25
89	New Germany, g.	N. S.	100,000	100,000	1	*
90	New Pittsburg, s. L.	Colo.	2,000,000	200,000	10	*
91	N. Commonw'th, s.	Nev.	10,000,000	100,000	100	85,000 April 1890 .25
92	North Standard, g.	Cal.	10,000,000	100,000	100	20,000 Nov
93	Nucleus, g.	Cal.	600,000	60,000	10	208,000 Dec. 1881 .10
94	Oneida Chief, g.	Cal.	500,000	125,000	100	*
95	Oriental & Miller, s.	Nev.	10,000,000	400,000	25	*
96	Osceola, g.	Nev.	5,000,000	500,000	10	*
97	Overman, g. s.	Nev.	11,520,000	115,200	100	3,832,800 Dec. 1889 .25
98	Park, s.	Utah	2,000,000	200,000	10	
99	Peerless, s.	Ariz.	10,000,000	100,000	100	165,000 Oct. 1890 .10
100	Peerless, s.	Ariz.	10,000,000	100,000	100	405,000 Oct. 1890 .15
101	Phœnix.	Ariz.	500,000	500,000	1	*
102	Phœnix, g. s.	Ark	5,000,000	200,000	25	*
103	Phœnix Lead, s. L.	Colo.	100,000	100,000	1	*
104	Pilgrim, g.	Cal.	600,000	300,000	2	*
105	Potosi, s.	Nev.	11,200,000	112,000	100	1,573,000 Mar 1890 .50
106	Poustie, s.	Idaho	250,000	250,000	1	*
107	Puritan, s. g.	Colo.	1,500,000	150,000	10	*
108	Quincy.	Colo.	3,000,000	300,000	10	
109	Rappahannock, g. s.	Va.	250,000	250,000	1	*
110	Red Elephant, s.	Colo.	500,000	500,000	1	*
111	Ropes, g. s.	Mich.	2,000,000	80,000	25	147,200 July 1887 .50
112	Rugell Green, c.	N. C.	1,500,000	300,000	5	
113	Sampson, g. s.	Utah	10,000,000	100,000	100	288,157 July 1888 1.08
114	San Sebastian, g.	San S.	1,600,000	320,000	5	*
115	Santa Fe, c.	N. M.	5,000,000	500,000	10	
116	Santiago, g.	U.S.C.	400,000	200,000	2	*
117	Security, s.	Colo.	10,000,000	1,000,000	10	
118	Sheridan.	N. M.	2,000,000	200,000	10	
119	Silver Queen, c.	Ariz.	5,000,000	500,000	25	*
120	South Bulwer, g.	Cal.	10,000,000	100,000	100	100,000 May 1881 .25
121	South Hite.	Cal.	10,000,000	100,000	100	195,000 Jan. 1883 .05
122	South Pacific.	Cal.	500,000	100,000	5	
123	Stanislaus, g.	Cal.	2,000,000	200,000	10	
124	St. Kevin, g. s.	Colo.	100,000	100,000	1	*
125	St. Louis & St. Elmo.	Colo.	5,000,000	500,000	10	*
126	St. Louis & St. Elmo.	Colo.	2,000,000	200,000	10	
127	St. L. & St. Felipe, g. s.	Mex.	1,500,000	150,000	10	
128	St. L. & Sonora, g. s.	Mex.	1,500,000	150,000	10	
129	St. Louis-Yavapai.	Ariz.	3,000,000	300,000	10	*
130	Sunday Lake, I.	Mich.	1,250,000	50,000	25	
131	Sullivan Con., g.	Dak.	200,000	200,000	3	*
132	Sutter Creek, g.	Cal.	500,000	100,000	5	
133	Sutro Tunnel	Nev.	20,000,000	2,000,000	10	*
134	Sylvanite, s.	Colo.	5,000,000	500,000	10	*
135	Taylor-Plumas, g.	Cal.	1,000,000	200,000	5	10,000 Feb. 1888 .10
136	Tioga Con., g.	Cal.	10,000,000	100,000	10	295,000 May 1888 .25
137	Tornado Con., g. s.	Nev.	100,000	100,000	1	*
138	Tortilla, c. s.	Ariz.	1,000,000	100,000	110	*
139	Tuscarora, s

NEW YORK MINING STOCKS QUOTATIONS

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Jan. 31.		Feb. 2.		Feb. 3.		Feb. 4.		Feb. 5.		Feb. 6.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams					1.80								300
Alice													
Aspen, Colo			6.00										200
Atlantic, Mich	16.25						16.75						200
Belcher, Nev													
Bodie Cons., Cal													
Bos. & Mont., Mont	42.13												30
Breece, Colo													
Bulwer, Cal													
Caledonia	.55										.65		200
Calumet & Hecla, Mich							251¼						30
Catalpa, Colo													
Chrysolite, Colo													
Colorado Cen.,Con,.Colo													
Cons. Cal. & Va., Nev					5.00		5.12	4.90	5.00	4.85	*5.50	5.25	570
Crown Point, Nev	1.95										2.30		300
Deadwood, Dak							.75						50
Dunkin, Colo													
Eureka Con., Nev	3.00												100
Father de Smet													
Franklin	17.88												50
Freeland, Colo	.17				.15				.17				800
Gould & Curry, Nev													
Hale & Norcross, Nev													
Holyoke									.05				300
Homestake, Dak													
Horn-Silver, Utah	3.00		3.00				3.00				2.90		620
Independence, Nev													
Iron Hill, Dak											2.40		200
Kearsarge	11.88												100
Leadville C., Colo											.12		100
Little Chief, Colo			.34	.33									300
Mono, Cal													
Moulton, Mont							.40	.39					200
Mt. Diablo, Nev													
Navajo, Nev													
N. Belle Isle, Nev													
Ontario, Utah													
Ophir, Nev	2.75												100
Osceola, Mich													
Plymouth, Cal	2.45		2.50		2.25				2.00				725
Quicksilver, Pref													
" Com													
Quincy, Mich													
Robinson Cons., Colo													
Savage													
Sierra Nevada, Nev													
Silver Cord													100
Silver King, Ariz							.20						
Silver Mg. of L. V													
Small Hopes											.87		600
Standard							1.45						300
Stormont, Utah													
Tamarack, Mich													
Yellow Jacket, Nev	2.30						2.60						300

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Jan. 31.		Feb. 2.		Feb. 3.		Feb. 4.		Feb. 5.		Feb. 6.		SALES
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha, Nev													
Alta, Nev	.75		.75		.75								500
American Flag, Colo											.05		700
Andes, Nev													
Amador, Cal													
Astoria, Cal	.05	.04	.04		.04		.04						4,300
Belmont, Cal	.31		31		.31				.31		.31		1,400
Best & Belcher, Nev	3.20												100
Bonanza King, Cal													
Brunswick, Cal				.09	.08	2.14	.10	.12		.14	.12	.12	6,600
Bullion, Nev								2.30					200
Butte & Bost., Mont													
Castle Creek, Idaho													
Challar, Nev	2.30										2.45		300
Col. & Beaver, Idaho													
Commonwealth, Nev													
Comstock T., Nev	.16									.17	.16	.16	1,700
" bonds	.30		.30							.32			3,000
" scrip													
Con. Imperial, Nev													
Cons. Pacific, Cal													
Crescent, Colo													
Del Monte, Nev													
El Cristo, Rep. of Col								.65	.62	.65		.65	900
Exchequer													
Hollywood, Cal													
Huron, Mich	3.38							3.13					300
Julia, Nev												.27	.23 1,000
Justice, Nev													
King. & Pembroke													
Lacrosse, Colo													
Lee Basin, Colo													
Mexican, Nev	2.80				2.75		2.80						300
Middle Bar			.04		.04		.04						2,500
Monitor, Colo													
Mutual Sm. & Mg. Co	1.50		1.50		1.45		1.45		1.50		1.45		1,000
Nevada Queen, Nev													
N. Commonwealth, Nev													
Occidental, Nev								.96		.85		1.00	700
Oriental & Mil., Nev													
Overman, Nev													
Phœnix of Ariz	.60	.58	.58	.50	.62	.60	.60	.58					2,400
Phœnix Lead, Colo													
Potosi	5.88												100
Rappahannock													
S. Sebastian													
Scorpion											.30		300
Seg Belcher, Nev											1.40		100
Silver Queen													
Sullivan Con., Dak													
Sutro Tunnel, Nev													
Tioga, Cal													
Union Cons., Nev													
Utah, Nev	.90		.85										300

*Ex dividend. †Dealt at in the New York Stock Ex. Unlistedsecurities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 6,575. Non-dividend shares sold 28,700. Total, New York, 35,275.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Jan. 30.		Jan. 31.		Feb. 2.		Feb. 3.		Feb. 4.		Feb. 5.		SALES.
Atlantic, Mich	16.00	15.25	15.75		16.00		16.50						595
Bodie, Cal													
Bonanza Development							62½	.60	62½		.65	.60	1,000
Bost. & Mont., Mont	41.75	41.00	41.50	41.38	42.00	41.50	42.00	41.50	41.50	41.00	41.38	41.00	1,473
Breece, Colo													
Calumet & Hecla, Mich	250		250		253	252	255	250	253		260	259	218
Catalpa, Colo			.35										1,000
Central, Mich													
Chrysolite Colo													
Con. Cal. & Va., Nev													
Dunkin, Colo	62½								62½				500
Eureka, Nev													
Franklin, Mich	17.75	17.00	17.50		17.00		17.50				17.00		576
Honorine, Utah													
Horn Silver, Utah													
Kearsarge	12.00	11.75					12.50		12.25		12.75	12.00	336
Little Chief, Colo													
Little Pittsburg, Colo													
Moulton													
Napa, Cal													
Ontario, Utah													
Osceola, Mich	37.00	36.00	35.75		38.00	36.25	38.25	37.50	37.50	37.00	37.00	36.50	1,345
Pewabic, Mich													
Quincy, Mich					95.00		90.00		90.00	85.00	85.00		365
Ridge, Mich													
Sierra Nevada, Nev													
Silver King													
Stormont, Utah													
Tamarack, Mich	145	142			150	146			150				79
Tecumseh, Mich													

NAME OF COMPANY.	Jan. 30.		Jan. 31.		Feb. 2.		Feb. 3.		Feb. 4.		Feb. 5.		SALES.
Allouez, Mich					2.50				2.50				400
Arnold, Mich											43½		100
Aztec, Mich													
Brunswick, Cal													
Butte & Boston, Mont					15.00				15.25				300
Centennial, Mich	16.50	16.00			16.00	15.00	16.00		15.00		16.25	15.38	705
Comstock, T., Nev													
Copper Falls Mg													
Crescent, Colo	.15												100
Dana, Mich													
Don Enrique, N. M													
El Cristo, S. A													
Hanover, Mich													
Humboldt, Mich													
Hungarian, Mich													
Huron, Mich											.25		100
Mesnard, Mich													
National, Mich	3.00		3.25					3.00			3.00		1,200
Native, Mich													
Oriental & M., Nev													
Phoenix													
Pontiac													
Rappahannock, Va													
Santa Fe, N. Mex	62½	60			62½	52½	60	50	52½	50	55		2,400
Shoshone, Idaho													
South Side, Mich													
Star													
Washington, Mich													
Winthrop, Mich													

Boston: Dividend shares sold, 7,487. Non-dividend shares sold, 5,305. Total Boston, 12,792.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS.					
	Jan. 30.	Jan. 21.	Feb. 2.	Feb. 3.	Feb. 4.	Feb. 5.
Alpha						
Alta	.65		.65	.60	.65	.60
Belcher						
Belle Isle	.25		.25	.45		.55
Best & Bel	3.00		3.05	3.05	3.10	3.05
Bodie	.90		.85	.90	.95	1.00
Bulwer	.40		.40	.40	.30	.30
Challar	2.20		2.20	2.30	2.30	2.20
Com'wealth	.75		.75	.70	.70	.70
Con. C. & V	4.70		4.85	5.00	4.95	5.12½
Con. Pacific						
Crown Point	1.50		1.90	1.90	2.00	2.05
Eureka C	2.50		1.80	2.80	2.75	
Gould & C	2.60		1.60	2.55	2.65	2.90
Grand Prize						
Hale & N	1.50		1.55	.55	1.50	1.55
M. White						
Mexican	2.65		2.65	2.75	2.70	2.75
Mono	.65		.55	.55	.55	.60
Mt. Diablo						
Navajo	.20		.20	.20	.25	.25
Nev. Queen	.20		.25	.20	.30	.25
N. Belle Isle	.50		.45	.45		
N.Com'w'lth						
Ophir	3.55		3.65	3.75	3.70	3.75
Potosi	2.12½		5.00	5.00	5.00	4.95
Savage	2.25		2.20	2.15	2.10	2.20
Sierra Nev	1.90		2.25	2.35	2.30	2 35
Union Con	2.05		2.05	2.05	2.20	2.40
Utah	.80		.75	.80	.80	.80
Yellow Jak	2.35		2.35	2.40	2.65	2.60

COAL STOCKS.

NAME OF COMPANY.	Par val. of shares.	Jan. 31.		Feb. 2.		Feb. 3.		Feb. 4.		Feb. 5.		Feb. 6.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal														
Cambria Iron		21	20	21	20			23	21⅝					165
Cameron Coal & I.Co														
Ches. & O. RR	100													
Chic. & Ind. Coal RR	100													
Do. pref	100													
Col. C. & I	100	36⅞		37½	37	37⅝	37			37¼		37¼	37	1,700
Col. & Hocking C. I	100							18						100
Consolidation Coal	100													
Del. & H. C	100	134¼	133⅜	135¾	134¾	136	135½	139½	135¼	138	137¾	138¾	137¾	3,436
D., L. & W. RR	50	137½	136¾	138	137⅝	138½	137⅝	139	137¾	139¼	138¼	138¾	138¼	41,962
Hocking Valley	100	25¾		26¾		27	26⅝			27⅝	27	27½		2,000
Hunt. & Broad Top		20¼	20	21½	21	23	22¼	23	22⅞	22⅞				1,126
Do. pref				44¼		45	44¾	46	45	46				720
Illinois C. & Coke Co														
Lehigh C. & N	50	47½				47⅝		47½	47⅛	47⅜	47⅛			535
Lehigh Valley RR	50	50½		47½	47¼	51	50⅞	50¾	50⅛	50⅝	50½			1,579
Lehigh & Wilk.Coal	100													
Mahoning Coal	100													
Do. pref	100													
Maryland Coal										16				500
Morris & Essex	100							147½	146					170
New Central Coal	50													
N. J. C. RR	100	108	109	111		112		116	111½	116	115½	116½	116	6,750
N. Y. & S. Coal	100													
N. Y., Susq. & West	100			9⅛	8	9⅛	8¾	9⅛	8⅞	9	8¾	9⅛	9	4,795
Do. pref	100			33¼	33	33¾	33	33¾	33¼			33¼		935
N.Y. & Perry C. & I	100													
Norfolk & West.RR	50	16		15⅞								17	16½	285
Do. pref	50			55¼		56⅜	56					56½		351
Penn. Coal	50													
Penn. RR	50	51⅞	51¾	52	51¾	51⅞	51¾			52	51⅞			2,540
Ph. & R. RR		31¾		32½	33			33	32½	33½	33¼	33⅝	33	**13,816
Sunday Creek Coal														
Do. pref	100													
Tennessee C. & I. Co		36	35⅝	37	35	37	35½	37	36¼			36¾		2,906
Do. pref								86						100
Westmoreland Coal														

**Sales in New York, 7,300; in Philadelphia, 4,508. Total sales, 86,473.

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L. H.	Asked. L. H
Atlantic Coal	.90	$1.50
Balt. & N. C.	.07@.08	.12@.15
Big Vein Coal	....	1.10
Conrad Hill	....	.10
Cons. Coal	.24@.24½	.26@ 27
Diamond Tunnel	....	....
George's Crk. C.	1.10	1.15
Lake Chrome	....	....
Maryland & Charlotte	....	....
North State	....	....
Silver Valley	.60@.75	.70@.80

Prices bid and asked, lowest and highest, during the week ending February 5.

Birmingham, Ala. Feb. 4.

COMPANY.	Bid. L. H.	Asked. L. H.
Ala. Coal & I. Co.	....	$100
Ala. Conn. C. & C. Co.	....	$23
Ala. R. Mill Co	$100	....
*Alice Furnace	$101	....
Anna Howe G. Mg. Co.	$⅛	$⅜
Bessemer Land	$28½	$29
Bir. Mg. & Mfg.	....	$35
Cahaba Coal Mg. Co.	....	$61
Camille Gold Mg. Co.	$½	....
De Bardeleben C. & I. Co.	$48	....
Decat. L. Imp.	$83¾	$91⅝
Decatur Min. L.	....	$19
Ensley Land	$7¼	$7½
*Eureka	....	....
Florence L. & Mg. Co.	....	$13¼
Gadsen Land	$3¾	$4
Hecla Coal Co.	....	....
Hen. S. & M. Co.	$3	$4½
Jagger-Townl'y C. & C. Co.	$8¼	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co.	....	$25
Sheffield C. & I. Co.	$13	$50
Sloss I. & S	$18	$22
†Sloss I. & S	$87	$89
‡‡Sloss I. & S	$49	$52½
Tuscaloose C. I. & L. Co.	....	$24
Ten. C. & I. Co.	$36	$36½
" pref.	$83	$85
Vulcan C. & C. Co	$5	....
Woodstock I. Co.	....	$30

* Bonds. † First mortgage. ‡‡ Second mortgage. ** Without interest.

Pittsburg, Pa. Feb. 5.

COMPANY.	B. $	A. $	Closing. $
Allegheny Gas Co.	....	....	....
Bridgewater Gas Co.	....	....	....
Chartiers Val. Gas	....	10.00	10.00
Columbia Oil Co.	1.00	3.00	1.00
Consignee Mg. Co.	.30	1.50	1.00
Consolidated Gas Co.	....	....	....
East End E. Light Co.	....	....	....
East End Gas Co	....	....	....
Forest Oil	....	....	....
Hazlewood Oil Co.	....	....	....
La Noria Mining	.15	.25	.25
Luster Mg. Co.	20.00	21.25	21.25
Mansfield C. & C. Co.	....	....	....
Manufacturers Gas Co.	20.00	25.00	....
Nat. Gas Co. of W. Va	....	60 00	60.00
N. Y. & Clev. Gas Coal.	....	....	....
Ohio Valley Gas	....	....	....
Pennsylvania Gas	....	....	....
People's Natural Gas.	....	....	....
People's N. G. & P. Co.	....	7.38	7.38
Philadelphia Co.	10.50	11.75	....
Pine Run Gas Co.	....	....	....
Pittsburg Gas	....	....	....
Silverton Mg. Co.	1.00	2.00	2.00
South Side Gas.	....	....	....
Tuna Oil Co.	....	60.00	60.00
Union Gas.	....	....	....
Washington Oil Co.	80.00	85.00	80.00
W'house Brake Co.	....	....	....
W'house A. B. Co.	91.00	100.00	96.00
W'house E. Light.	7.88	13.88	13.88
W'moreland & Camb.	....	....	....
Wheeling Gas.	13.00	16.00	16.00
Yankee Girl Mg	....	....	....

St. Louis. Feb. 4.

CLOSING PRICES.

COMPANY.	Bid. $	Asked. $
Adams, Colo.	....	$1.95
American & Nettie	.41¼	.50
Aztec, N. Mex.	.08	....
Bi Metallic	....	....
Central Silver	.06½	.07½
Cleveland, Colo.	....	....
Cleveland & An'r.	....	....
Coeur d Alene	....	....
Elizabeth	2.50	2.55
Gold King	.08	.10½
Granite Mountain, Mont.	....	....
Hope	....	....
Ingram	....	....
I. X. L., Colo.	....	....
La Union	.02	.02½
Little Albert	.15	....
Montrose Placer, Colo.	.47½	.50
Major Budd, Mont.	....	....
Mexican Imp.	....	....
Mickey Breen	.80	.82½
Mountain Key	....	....
Nellie	....	....
Old Colony	....	....
Pat Murphy, Colo.	.03	.04
Puzzle	....	....
Richmond Hill	....	....
Samoa	....	....
Silver Age, Colo.	1.45	....
Small Hopes, Colo.	.85	....
Tourtelotte	....	....
West Granite, Mont.	....	....
Wire Patch	.13½	.15
Yuma, Ariz.	.46¼	.50

Trust Stocks. Feb. 6.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

Am. Cotton Oil. Com	$181½@$19
" " Pfd	41½@ 42½
" " " Tr. Repts	21 @ 21½
Am. Sugar Refineries, Com.	73⅝@ 73⅞
" " Pfd	89 @ 89⅞
Cattle Trust	.... @ ....
Distillers' & Cattle Feeders'.	4⁰¾@ 47¼
Linseed Oil	40 @ 41
National Lead	19¼@ 19¾
Standard Oil	164 bid.
Sugar Refineries, Tr. repts	86½@ 87

Trust Receipts.

Sales at the New York Stock Exchange week ending Jan. 30:

	Sales.	Price H.	Price L
*American Cotton Oil	745	21½	19¾
National Lead	22,112	20⅜	19⅛
*Sugar	29 870	85	77

* Trust receipts.

Foreign Quotations.

COMPANY.	London. Highest.	Jan. 23. Lowest.
Almada, Mex.	2s. 9d.	2s. 3d.
Amador, Cal.	8s. 6d.	6s. 6d.
Appalachian, N. C.	4½d.	1½d.
Canadian Phos., Can.	£½	£¼
Colorado, Colo.	3s.	2s. 6d.
Comstock, Utah.	....	....
Cordova	....	....
Cons. Esmeralda, Nev.	2s. 6d.	2s.
Denver Gold, Colo	6d.	....
Dickens Custer, Idaho.	1s.	9d.
East Arevalo, Idaho.	2s.	1s.
El Callao, Venezuela	....	....
Elmore, Idaho	1s.	6d.
Garfield, Nev	1s.	9d.
Jay Hawk, Mont.	1s. 9d.	1s. 3d.
Josephine, Cal.	1s.	0d.
Kohinoor, Colo.	6d.	....
La Luz, Mex	1s. 6d.	1s.
La Valera, Mex.	21s. 3d.	18s. 9d.
Montana Lt., Mont.	16s.	14s.
New California, Colo.	5s. 3d.	4s. 9d.
New Consolidated	9d.	3d.
New Eberhardt, Nev.	1s. 3d.	9d.
New Emma, S., Utah.	2s. 9d.	2s. 3d.
Newfoundland, N. F.	3s. 6d.	3s.
N. Gold Hill, N. C.	2s. 3d.	1s. 9d.
New Guston Colo.	£3½	£2⅞
New Hoover Hill, N.C.	1s.	6d.
Old Lout, Colo	....	....
Palmarejo, Mex.	10s. 9d.	10s. 3d.
Pinos Altos, Mex.	5s. 9d.	5s. 3d.
Pittsburg Cons., Nev.	7s. 9d.	7s. 3d.
Richmond Con., Nev.	£1⅛	£1¼
Ruby & Dunderb'g, Nev.	1s. 3d.	9d.
Sam Christian, N. C.	1s. 3d.	9d.
Sierra Buttes, Cal.	5s.	4s.
" Plumas Eur., Cal.	£⅝	£⅛
Sonora, Mex.	....	....
United Mexican, Mex.	6s. 6d.	5s.
U. S. Placer, Colo.	6d.	3d.
Viola Lt., Idaho	1s. 6d.	1s.
Yankee Girl, Colo.	17s. 6d.	16s. 6d.

Paris. Jan. 22.

	Francs.
Belmez, Spain	800.00
Callao, Venez	39.00
Callao Bis., Venez	14.00
East Oregon, Ore.	4.25
Forest Hill Divide, Cal.	....
Golden River, Cal.	1 0.00
" " parts	30.00
Lexington, Mont	110.00
" " parts	3 00
Rio Tinto, Spain	580.00
Tharsis, Spain	157.00

CURRENT PRICES.

Those quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, ℔ 100 lbs. $1.75@$2.00
Muriatic, 18° ℔ 100 lbs. .80@1.00
Muriatic, 20° ℔ 100 lbs. .90@1 10
Muriatic, 22° ℔ 100 lbs. 1.00@1.20
Nitric, 36° ℔ 100 lbs. 4.00@4.29
Nitric, 42° ℔ 100 lbs. 3.50@4.00
Oxalic, ℔ 100 lbs. 6.50@10.50
Sulphuric, 60° ℔ 100 lbs. .70@.80
Sulphuric, 66° ℔ 100 lbs. .75@.90

Alkali—
Refined, 48 p. c. 1.60@1.65
Refined, 58° 1.55@1.90

Alum—Lump, ℔ lb. .04
Ground, ℔ lb. 05
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £4 10

Ammonia—Sul., ℔ 100 lbs. 3.15
Carb, ℔ lb. 7½@8¼

Aqua Ammonia—18° ℔ lb. 4¼
20°, ℔ lb. .6
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11

Ammoniates—Azotine, ℔ unit 1 95@ 2 06
Blood, dried, red, ℔ unit, west 1 80@ 1 00
low grade, ℔ unit. 1 70@ 1 80
Concentrated tankage, ℔ unit 1 75@ 1 80
Bones, rough, ℔ ton. 20 00@23 00
ground, ℔ ton. 25 00@28 00
Bone black, refuse, ℔ ton 17 50@19 50
Kieserite 6 00@ 6 50
Fish guano, dried 18 50@19 00
acidulated 10 00@— 00
wet 8 50@ 9 50
Phosphate rock, f. o. b Char'n 6 00@ 7 25
undried — @ 6 —
dried 7 00@ 7 50
ground 8 00@11 50
Acid phosphate, 14% per unit. 72½@ 75

Arsenic—White, powdered ℔ lb. 3¼@3½
Red ℔ lb. 5¾@ 6¼
White at Plymouth, ℔ ton £12 2 6

Asbestos—Am., ℔ ton $50@$300
Italian, ℔ on c. i. f. L'pool £18@£60

Ashes—Pot, 1st sorts. ℔ lb. 4¾@4⅞
Pearl 6¼@6½

Asphaltum—P. ton. 13.00
Prime Cuban. ℔ lb. 4½@5¼c.
Hard Cuban. P ton $28.00
Trinidad, refined, ℔ ton $30.00
Egyptian 8@9

Barium—Nitrate, ℔ lb. 8@8½

Barytes—Sulph., Am. prime white 17@20
Sulph., foreign, floated, ℔ ton. 19½@21 50
Sulph., off color. ℔ ton. 11.50@14.00
Carb., lump, f. o. b. L'pool, ton £6
No. 1. Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " 3 15 0

Beach—Over 35 p c, ℔ lb. 1.85@1.90

Borax—Refined, ℔ lb. 9½@9¾
Concentrated 7¾@8⅜
Refined " Liverpool ℔ ton £29

Brimstone—*See Sulphur.*

Bromine—℔ lb. .37@38

Chalk—℔ ton. 1.75
Precipitated, ℔ lb. 4½@5

China Clay—English, ℔ ton 13.50@18.50
Southern, ℔ ton. 13.50

Chrome Yellow—℔ lb. 10@2

Cobalt—Oxide, ℔ lb. 2.60@2.90

Copper—Sulph. English Wks. ton £20@£21

Copperas—Common, ℔ 100 lbs. 70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.

Corundum—Powdered, ℔ lb. 4½@.9

Cream of Tartar—Am. 99% 22½
Powdered, 99 p. c. 23

Emery—Grain, ℔ lb. 4½@5
Flour, ℔ lb. 2¾@3½

Feldspar—Ground, ℔ ton 15.00

Fuller's Earth—Lump, ℔ bbl. 9.00@95
Powdered, ℔ lb. 1⅞@2

Gypsum—Calcined, ℔ bbl. 1.25@1 50

Iodine—Resublimed 2.75

Kainit—℔ ton. $9.75@$10

Kaolin—*See China Clay.*

Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6¾@7¼
White, English, ℔ lb. 8½@8¾
Acetate, or sugar of, white 12@13
Nitrate 9@10

Lime Acetate—Amer. Brown .95@1.00
" Gray 1.75@1.87½

Litharge—Powdered, ℔ lb. 6½@6¾
English flake, ℔ lb. 9@9½

Magnesite—Greek, ℔ ton 20.00

Manganese—Crude, per unit. 23@28
Oxide, ground, per lb. 2½@6½

Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. 70@72

Metallic Paint—Brown per ton. $20@25
Red $20@25

Mineral Wool—℔ lb. 2

Mica—In sheets according to size.
1st quality, ℔ lb. 25@$6.00

Naphtha—Black 60

Ochre—Yellow, "B. F.," ℔ ton, f. o. b. mill 30.00
"J. F. L. S.," ℔ lb. ex dock 2½
Yellow 10@25
Rochelle 1.35@1.50
Washed Dutch 5@—
Washed French 1½@2½
Washed Nat Oxford, Lump 6½@6¾
Washed Nat Oxford, Powder 7@7½
Golden 3¾@4
Domestic ¾@1¼
Domestic, for O. C. & W. P. ⅝@1

Oils, Mineral
Cylinder, light filtered 15@20
Dark filtered 14@21
Extra cold test —@—
Dark steam refined 10@18

Phosphate Rock—S. Carolina, per ton f. o. b. Charleston 6.00@7.25
Ground, ex vessel New York 11.00
Canadian Apatite, lump, f. o. b. at Montreal, ℔ ton 16.00

Phosphorus—℔ lb. 64@65
Precip., red 100@102
white 100@103

Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7

Potassium—Cyanide, ℔ lb 39@40
Bromide, ℔ lb 33
Chlorate, English, ℔ lb 11@14
Chlorate, powdered 13@14
Carb, ℔ lb 4.70@5.54
Caustic, ℔ lb. 7½@8
Iodide 2.65@2.70
Muriate, ℔ 100 lbs. 1.82½
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb 10½@11
Dble. m'ure salt, basis of 48@50%. 1.07½
Sulphate, basis of 90% ℔ 100 lbs. 2.05
Yellow Prussiate 17½@18
Red Prussiate 42@45

Pumice Ston—Select lumps, lb. 3¼
Original cks., ℔ lb. 1¾@2
Powdered, pure, ℔ lb. 2¼@2½

Pyrites—Non-cupreous, p. units 10d.

Quartz—Ground, ℔ ton. 14.00@16.00

Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb. 6@10

Salt—Liverpool, ground, ℔ sack 75@80
Turk's Island, ℔ bush. 25@28

Salt Cake ℔ lb. 7@75

Saltpeter—Crude, ℔ lb. 5¼@5½
Refined, ℔ lb. 6@8

Silex, ℔ ton. 14@25

Soda—Carb ash, 48% 1.60@1.65
high test 1.55@1.60
Caustic ash, 48% 1.62½@1.65
" high test 1.60
Newcastle, 48% — @ —
" high test 1.50@1.55
Bicarb, English 3.50@3.75
" American 3@3½
Crystal, carbonate 1.95@2.00
Caustic, 60% 3.40@5.50
" 70% 3.15@3.20
" 74% 3.15@3 20
" 77% 3.25@3.37½
Sal, English 1.17½@1.20
" American 1.10@1.15
Nitrate 1.80@1.85
Prussiate 17½@18
Phosphate .7@18
Stannate .8@15

Strontium—Nitrate, ℔ lb. 9@9½

Sulphur—Roll, ℔ lb. 1¾
Flour, ℔ lb. 20
Crude Brimstone, 2s., ℔ ton 27 00
Crude Brimstone 3d s, ℔ ton. 26 50

Sylvinit, 23@27%, S. F. P., per unit. 40@42½

Talc—Ground French, ℔ lb. 1½@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton £4 5

Terra Alba—French 80@85
English 75@80
American, No. 1 —@—
American, No. 2 40@50

Tin—Crystals 15½@16
Muriate .8@ 3

Vermillion—American, ℔ lb. 61
English ℔ lb 82@85

Vitriol—(Blue), Ordinary, ℔ lb. 5½@5⅝
Extra, ℔ lb. 7

Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb 6½@7
* Spot.

THE RARER METALS.

Aluminum—(Metallic), per lb. $1.50@$2
Sheet, per lb 2.50

Arsenic—(Metallic), per lb .40

Barium—(Metallic), per gram 4.00

Bismuth—(Metallic), per lb. 2.75

Cadmium—(Metallic), per lb. 1.00

Calcium—(Metallic), per gram 10.00

Cerium—(Metallic), per gram. 7.50

Chromium—(Metallic), per gram. 1 00

Cobalt—(Metallic), per lb. 6.00

Didymium—(Metallic), per gram. 9.00

Erbium—(Metallic), per gram. 7.50

Gallium—(Metallic), per gram. 140.00

Glucinum—(Metallic, per gram. 12.00

Indium—(Metallic), per gram. 9.00

Iridium—(Metallic), per oz. 7.00

Lanthanum—(Metallic), per gr. 10.00

Lithium—(Metallic), per gram. 10.00

Magnesium Per lb. 4.50

Manganese—(Metallic), per lb. 1.10
Chem. pure, per oz. 10.00

Molybdenum—(Metallic), per gm .50

Niobium—(Metallic), per gram. 5.00

Osmium—(Metallic), per oz. 65.00

Palladium—(Metallic), per oz. 35.00

Platinum—(Metallic), per oz. 20.00@25.00

Potassium—(Metallic), per lb. 28.00

Rhodium—(Metallic), per gram. 5.00

Ruthenium—(Metallic), per gm. 5.50

Rubidium—(Metallic), per gram. 2.00

Selenium—(Metallic), per oz. 1.80

Sodium—(Metallic), per lb. 2.50

Strontium—(Metallic), per gm. .60

Tantalum (Metallic), per gram. 9.00

Tellurium—(Metallic), per lb. 5.00

Thallium—(Metallic), per gram. 25

Titanium—(Metallic), per gram. 2.25

Thorium—(Metallic), per gram. 17 00

Tungsten—(Metallic), per oz. 2.25

Uranium—(Metallic), per lb. 5.00

Vanadium—(Metallic, per gm. 22.00

Yttrium—(Metallic), per gram. 9.00

Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Pale, ℔ 1,000 3.00@3.50
Jerseys, ℔ 1,000 4.75@5.25
Up Rivers, ℔ 1,000 5. 0@5.50
Haverstraw seconds, ℔ 1,000 5.50@6.00
Haverstraw firsts, ℔ 1,000 6.00@6.25
Fronts, nominal, ℔ 1,000 —@—
Croton 14.00@16 00
Wilmington 20.00@21.00
Philadelphia @22 00
Trenton @22.00
Baltimore .....

Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu ft. 45@1.25
Granite, Scotch, ℔ cu. ft. 1.00@1.15

Cement—Rosendale, ℔ bbl. 85@1.10
Portland, American, ℔ bbl. 2.15@2.45
Portland, foreign, ℔ bbl. 2.40@2.50
Portland, " special brands 2.60@2.85
Roman, ℔ bbl. 2.75@2.90
Keene's course, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.25@8 50

Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black roofing, ℔ 100 sq. ft. 4.25@5.50

Lime—Rockland, common, ℔ bbl .90
Rockland, finishing, ℔ bbl. 1.10
St. John, com. and finish., ℔ bbl. 85@ .90
Glens Falls, com. and fin., ℔ bbl. 85@1.10

Labor—Ordinary, ℔ day 1.50@2.00
Masons, ℔ day 4.00
Plasterers, ℔ day 4.00
Carpenters, ℔ day 3.50
Plumbers, ℔ day 3.50
Painters, ℔ day 2 50@3.50
Stonesetters, ℔ day 3.50@4.00
Tilelayers, ℔ day 3.50@4.50
Bricklayers, ℔ day 4.0

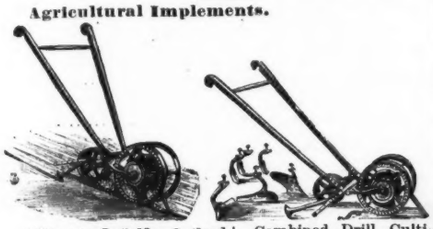
NEW YORK PRICES CURRENT. FEB. 7, 1891.

In the interest of the extension of the markets for American manufactures the ENGINEERING AND MINING JOURNAL has secured the services of gentlemen thoroughly acquainted with the export trade and with foreign markets, and it offers its services to foreign buyers who may desire information concerning any article whatever of American manufacture. No charge will be made for these services, either directly or indirectly through commissions on goods purchased. The proprietors of the ENGINEERING AND MINING JOURNAL are neither commission merchants nor exporters, but they have many sources of information, both at home and in foreign countries, and place these at the service of manufacturers and exporters here and of importers and consumers in other countries.

The names and addresses of the manufacturers of goods quoted in this list can be obtained by applying at this office.

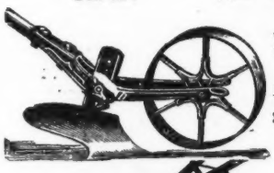
Discounts are for Wholesale Export Only.

Agricultural Implements.



"Planet, Jr." No. 2 Seed Drill, $9. Dis. 30%.

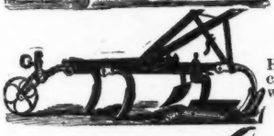
Combined Drill Cultivator Rake, Plow, etc., $12. Dis. 30%.



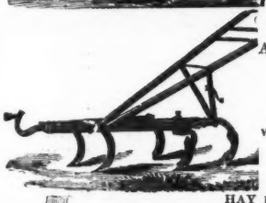
"Fire Fly" single-wheel Hoe, Cultivator and Plow, $5.

"Fire Fly" Hand Plow, $2.50.

30 % discount, f.o.b. New York.



All Steel Horse Hoe and Cultivator combined, with wheel, $6 75-100 net.



All Steel Plain Cultivator.

With wheel, $4.50; without wheel, 60c.

HAY FORKS.

Standard Spading Forks.
Solid Steel Shanks, Gold Bronze Finish, Patent Overcaps.
Per doz.

8 D 4 light angular tine, iron D, plain ferrules, $17.00.
8 D S 4 light angular tine, iron D, strapped ferrules, $18.50.
11 D 4 light angular tine, iron D, plain ferrules, blue, half polished, $16 00.
13 D 4 light angular tine, iron D, strapped ferrules, blue, half polished, $17.50.
15 D 5 tine, angular tine, iron D, plain ferrules, $21.00.
17 D 5 tine, angular tine, iron D, strapped ferrules, $25.50.

Flat Tines.

D 4 tine spading fork, flat tine, iron D, plain ferrules, $17.00.
D S 4 tine spading fork, flat tine, iron D, strapped ferrules, $18.50.

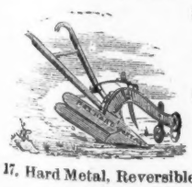
74 4 tine spading fork, flat tine, 4 ft. handles, plain ferrules, $16.00.
74 S 4 tine spading fork, flat tine, 4 ft. handles, strapped ferrules, $17.50.
Dis., 35 and 5% and 2½.

Manure Forks.

4 D, oval, 4 tine, 13 in. tine, iron D, plain ferrules, $13.50.
4 D S, oval, 4 tine, 13 in. tine, iron D, strapped ferrules, $15.00.
5 D, oval, 5 tine, 13 in. tine, iron D, plain ferrules, $20.50.
5 D S, oval, 5 tine, 13 in. tine, iron D, strapped ferrules, $22.00.
6 D oval, 6 tine, 13 in. tine, iron D, plain ferrules, $23.50.
6 D S, oval, 6 tine, 13 in. tine, iron D, strap ped ferrules, $25.00.
Dis., 35 and 5% and 2½.

PLOWS.

Reversible Oneonta Clipper.



16. Oneonta Clipper, Reversible, Iron beam Cutter..... $14
" Oneonta Clipper, Reversible, Iron Wheel and Cutter..... 15
18. Oneonta Clipper, Reversible, Iron Beam Cutter..... 15
" Oneonta Clipper, Reversible, Iron Beam, Wheel and Cutter.... 16
17. Hard Metal, Reversible, Iron Beam Cutter..... $17
17. Hard Metal, Reversible, Iron Beam, Wheel and Jointer..... 17
19. Hard Metal, Reversible, Wood Beam Cutter..... 16
" " " " " " Wheel and Jointer..... 17
20. Steel Mould Board, Reversible, Wood Beam Cutter 15
" " " " " " Wheel and Cutter..... 16

Iron Beam Plows.

Two-horse Sod and Stony Land.... 8.50 plain.
Curtis's Sod Two horse..... 11.5C "
" " " " ..... 13.00 cutter.
" " " " ..... 14.25 wheel & cutter.

Subsoil Plows.

Two-horse 9.50 Draft Rod.
" " 11.00 Wheel and Draft Rod.

Hitchcock's Potato Digger and Shovel Plow.

Improved adjustable handle shovel plow..... 7.00
Hitchcock's Potato Digger..... 8.00
" " " and shovel plow..... 10.50
Dis. 30%.

HOES.

Blade Solid Shank Hoes.

Field, 7	× 5	in.,	selected handles	$8.00
" 7½	× 4½	"	" "	8.00
" 8	× 4¾	"	" "	8.00
" 8½	× 4½	"	" "	8.00
" 8	× 5	"	" "	8.00

Field Socket Hoes..... $9.00

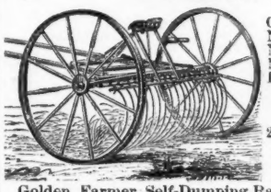
Dis., 65% and 5%.

RAKES.

The S. R. N. Improved.

20 Teeth	$28.00
22 "	29.00
24 "	30.00
26 "	31.00

Dis., 33⅓%.



Chieftain Lock Lever

No. 1	$16.00
No. 2	16.00
No. 5	15.00

Iron wheels, $1 extra. With Pole, Double Tree and Neck Yoke, $1 extra. 22 cubic feet packed, 400 lbs. gro., 225 lbs. net.

Golden Farmer Self-Dumping Rake, $19.00; 22 cu. ft., 430 lbs. gro., 250 lbs. net.
Chieftain Hay Tedders, $27.00; 700 lbs. gro., 450 lbs. net.
Potato Diggers, $5.00; 100 lbs. gro., 60 lbs. All net cash, f.o.b. ship New York or Boston.

RAKES (GARDEN).

Malleable Iron Garden Rakes, Per Doz.

						Plain.
8 teeth, 6-ft. handles, straight shank						$5.00
10	"	"	"	"	"	5.50
12	"	"	"	"	"	6.00
14	"	"	"	"	"	6.50
16	"	"	"	"	"	7.00

For braced goods, add 50 cents per dozen to list.

Cast Steel Garden Rakes, Per Doz.

				Plain.	Braced.
8 teeth, 6-ft. handles				$8 00	$9.50
10	"	"	"	9.00	10.50
12	"	"	"	10.00	11.50
14	"	"	"	11.00	12.50
16	"	"	"	12.00	13.50

Lawn Rakes and Gravel Rakes same price as Garden Rakes.

Discounts on Rakes from list.
The P. H. & M. Co., 60 and 10%.
W. & C. Mfg. Co., 70%.
S. F. & T. Co., 70 and 5%.
G. T. Co., 70 and 5%.
Phila. S. H., 60, 10 and 5%.

SCYTHES (GRASS).

Waldron's pattern, oiled	$8.50
Silver steel, painted	8.50
Western dutchman, bronzed and painted	9.00
Clipper, polished web	9.00
Fine cutlery steel, full polished	10.00
All steel, full polished	11.00

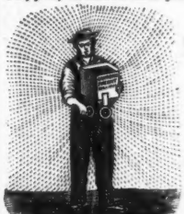
Grain Scythes.

Waldron's pattern, oiled	11.25
Silver steel, painted	11.25
Clover, oiled	11.25
Clipper, bronzed and painted	11.50

Lawn Scythes.

Clipper, bronzed and painted	9.00

Dis., 10and 10%.



SOWER, BROADCAST SEED.

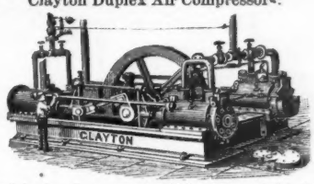
Per dozen..... $30 f.o.b

Gross wt., 110 pounds per dozen

Net wt., 75 pounds per dozen.

Air Compressors.

Clayton Duplex Air Compressors.



Special design for export. Shipping weight, 8,000 lbs. No one piece weighing over 300 to 400 lbs. Size No. 3¼. Steam cylinders, each 12 in. diameter; air cylinders, each 12 in. diameter, and stroke, 13 in.; capacity, six 3 in. rock drills. Price, $3,000 f.o.b. New York. Dis., 20%.

Anvils.

"Eagle" anvils.

	Weight about				Weight about	
No. 000	½	lb	$1 00	No. 4	40	lbs. $4.25
" 00	4	"	1.75	" 5	50	" 5.00
" 0	10	"	2.25	" 6	60	" 5.50
" 1	15	"	2.75	" 7	70	" 6.00
" 2	20	"	3.00	" 8	80	" 7.00
" 3	30	"	3.75	" 9	90	" 8.00

Anvils weighing 100 to 800 lbs., 10 cts. per lb. Discount 15 and 10 %.

Arms and Ammunition.

	Wood Powder. Kegs, 25 lbs.	½ keg.	¼ kegs. 6¼ lbs.	1 lb. cans.
Trap for first quality arms only	$19.50	9.85 trap. 8.60 let'd grades.	5.00	.85
A, for large bore..				
C, for general use..				
D, fine for small bore and rifles	17.00		4.35	.75
E, very fine for small bore rifles and gallery shooting				

Dis., 20-5 and 5%

	Discount. Per cent.	
Bullet Breech Caps per lb.	1.60	10
Corical Bullet Caps "	1.75	10
	Discount. Per cent.	
Rim Fire Cartridges	60	10
Military Rim Fire Cartridges	15	10
Central Fire Pistol and Rifle Cartridges	40	10
Central Fire Metallic Cartridges for Target and Sporting Rifles	30	10
Military Cartridges, Central Fire	30	10
Lefaucheux Cartridges		60

Gatling Cartridges		Special
Primed Shells and Bullets	25	10
Friction Cannon Primers	20	10
Primers		10
Percussion Caps, F. C per M.	33c.	
U. M. C. "	42½c.	
Musket. "	45c.	
Brass Shot Shells, U. M. C., 1st qual	60	10
Club brand	65	10

Paper Shot Shells.

14, 16 and 20 ga. First quality, 30, 10 and 10 per cent; 4, 8, 10 and 12 ga., First quality, 25, 10 and 10 per cent.
14, 16 and 20 ga. Club brand, 30, 10 and 10 per cent.
10 and 12 ga. Club brand, 33⅓, 10 and 10 per cent.
Gun Wads, 20 and 10 per cent.

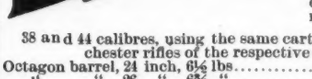
RIFLES.

Colts' Lightning Magazine.

			Discount 10 p	cen.
40/60 and 45/60 calibre octagon barrel			10 lbs.	$15.38
" " " "	round	"	9¾ "	14.25
" " " "	carbine	"	9 "	14.25
32, 38, and 44 calibres, octagon		"	7¼ "	13.50
" " " "	round	"	6¾ "	12.38
" " " "	carbine	"	6¼ "	12.38
" " " "	baby carbine		5¼ "	12.38
22 calibre, rim fire, octagon barrel				15.38
" "	round			14.25

Remington Light (Baby) carbines. 44 cal., blue, $8; nick. $8 50. Dis., 5%.

MARLIN RIFLE. MODEL, 1889.



The best in the market, embodying all latest improvements.

38 and 44 calibres, using the same cartridges as Winchester rifles of the respective sizes.

Octagon barrel,	24	inch,	6½	lbs	$19.50
" "	26	"	6¾	"	21.50
" "	28	"	7	"	23.50
Round "	24	"	6½	"	18.50
Carbine "	20	"	5½	"	17.50

Discount, 25, 10 and 10%.

REVOLVERS.

S & W.

32, Single Action, 3, 3½ in., $8.00.
32, Double Action, 3, 3½ in., $9.35.
32, Safety Hammerless, 3, 3½ in., $. 00.

38, Single Action, 3¼ in., $9.40; 38, Single Actio 4 $9.65; 38, Single Action, 5 in., $10.00; 38, Double Acti 3¼ in., $10.40; 38, Double Action, 4 in., $10.65; 38, Double Action, 5 in., $11.00; 38, Safety Hammerless, 3¼ in.,

$12.00; 38, Safety Hammerless, 4 in., $12.25; 38, Safety Hammerless, 5 in., $12.50; 44, Single Action, 4 in., $11.50; 44, Single Action, 5 in., $11.75; 44, Single Action, 6, 6½ to 12.00; 44, Double Action, 4 in., $12.50; 44, Double Action, 5 in., $12.75; 44, Double Action, 6½ in., $13.00; 44, Double Action Favorite, 5 in., $12.75.

Colts.

Discount, 10 per cent from following prices.

Double Action Army, 44 and 45 calibre, 4¾, 5½, 7½ inch bbl., $13.00.
Double Action, 41 calibre, 2½ to 6 inch bbl., $11.20.
" " 38 " 2½ to 6 " $10.00.
Single " Army, 45 calibre, 4¾, 5½, and 7½ inch bbl., $12.00.
Single Action Army, 44 calibre, "Frontier," 4¾, 5½, and 7½ inch bbl., $12.00.
New Line 32, $4.00.
" " 30, 2.00.
" " 22, half or full plate, 2.10.
Old Model, 22 calibre, by the hundred, half or full plate, $1.50.
Colt Deringer. 41 calibre, per pair half or full plate, 5.50.
National Deringers. 41 calibre, per pair, half or full late, $4.00.
New Police, 38, 4½ in., nickeled, $6.66.

American Bull Dog

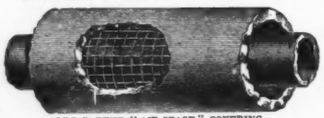
Double Action 32, 38 and 44 calibre, 2½ inch barrel, $1.60; Double Action 32, 38 and 44 calibre, 4½ inch barrel, $1.85; Double Action 32, 38 and 44 calibre. 6 inch barrel, $2.10 net.

F. & W. British Bull Dog revolvers, 32 and 38 calibre 2½ inch bbl., $1.85 net.
F. & W. Automatic revolver, 32 and 38 calibre, 3¼ inch bbl. $4.00 net.
H. & R. Automatic revolver, 32 and 38 calibre, 3¼ inch bbl., $3.75 net.

Net.

Defender revolvers, Single Action, 22, wood handle, 65.
" " " " 22, rubber " 70.
" " " " 32, wood " 85.
" " " " 32, rubber " 90.
Remington Army revolver, Single Action, 44 cal., frontier cartridge, 5¾ inch barrel, $6.50.
Remington Army revolver, Single Action, 44 cal., frontier cartridge, 7½ inch barrel, $6.00.
Remington Double Deringers, 41 cal., rim fire, $4.05.

Asbestos Goods.



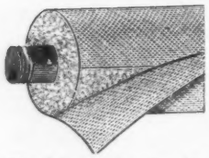
THE PATENT "AIR-SPACE" COVERING.

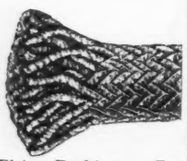
Patent air-space coverings. Per sq. ft., 25c. Discount, 20%.

Wick packing, per pound, 45c. Discount, 10%.

Removable pipe coverings. } See list. Sq. ft. 20c. Disc., 25%.

Tube cleaner, "The National," Per inch, $1. Discount, 60%.





Fire felt covering for steam pipes. Per sq. ft., 25c. See list. Discount, 25%.

Piston Packing. Per pound, 45c. Discount, 10%.

Asbestos fibre for filtering	per	lb.	40c.	disc 20%
" Cord 95c., and Sewing Twine, $1.35				
Asbestos cloth, 36 inches wide	per	yard	2.25	" 10%
" cement for boilers	per	bbl.	3.25	" 10%
" sheathing	per	lb.	.12½	" 10%
" building felt	"	"	.10½	" 10%
" hair felt for hot and cold water pipes	per sq. ft		See spec. list.	
Asbestos mill board	per	lb.	.12½	" 10%
" soldering blocks	per	doz.	See list.	

Assay Furnace.

Hydro-Carbon Blow-Pipe Assay Furnace.

No. 2, Muffle Furnace taking C Battersea Muffle 8x4¾x3 in. $10.00
No. 3, taking F Muffle, 10x6x4 in. 15.00
No. 1. Crucible Furnace, taking Battersea, U or Colorado B Crucible, 4 in. dia. 5½ deep. 4.00
No. 2, taking Battersea, round, 5 in. dia., 6¼ deep. 5.00
Blow-Pipe No. 2, with half gallon tank, made entirely of seamless brass. 23.00
Blow-Pipe No. 3, with one gallon tank, otherwise same as No. 2. 26.00
Blow-Pipe No. 2, Muffle Furnace No. 2, and Crucible Furnace No. 1. 37.00
Blow-Pipe No. 3, Muffle Furnace No. 3, and Crucible Furnace No. 2. 46.00
25% f. o. b. New York on wholesale orders.

Axes, etc.

Axes, Handled.

Brands,	Collins. doz.	Sharp. doz.	Pecks. doz.
Dis., %	10	35	Net
3½@4½ lbs.	$10.75	$15.00	9.50
4½@5¼ lbs.	11.00	15.50	9.50
4¼@6 lbs.	11.50	16.00	10.00
5@7 lbs.	12.50	17.50	11.00

Brands,	Hurd. doz. Net	American Ideal. doz. Net	Blair. doz. Net.	Freeman. doz. Net
3½@4½ lbs.	$8.50	$11.00	$8.00	$6.50
4¼@5¼ lbs.	8.50	11.00	8.00	7.00
4½@6 lbs.	8.75	11.25	8.25	7.00
5@7 lbs.	9.00	11.50	8.50	7.50

Brands,	Collins. doz.	Sharp. doz.	Pecks. doz.
Dis., %	10	50	50 & 5
Three-quarter axe	$8.00	$13.50	$13.50	$13.50
Boys' axe, No. 2	8.00	13.50	13.50	13.50
Half axe	7.00	12.50	12.50	13.00
Quarter axe	6.50	10.00	10.00	11.00

Brands,	Collins. doz.	Hurd. doz.	Freeman. doz.
Dis., %	60 5	50 5	25
Three-quarter axe	$13.50	$13.50	$7.50
Boys' axe, No. 2	13.50	13.50	7.50
Half axe	12.50	12.50	6.50
Quarter axe	12.00	12.00	6.00

Hatchets, with handles.

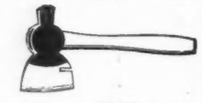
AXE PATTERN.

HUNTER'S.

Both patterns, same price.

	Collins.	Sharp.	Pecks.	Simmons.
Dis., %	10	50	50 & 5	50
Dozen	$6.00	$10.00	$9.00	$9.00

SHINGLING.



CLAW.

Shingling.

Brands,	Collins.	Sharp.	Pecks.	Mann.
Dis., %	10	50.5	50 & 5.	50.5
No. 1 Doz.	$4.75	$8.00	$8.00	$8.00
No. 2 "	5.25	8.50	8.50	8.50
No. 3 "	5.75	9.00	9.00	9.00

Claw.

Brands.	Collins.	Sharp.	Blair.	Mann.
Dis., %	10	50, 5	60, 5	50, 5
No 1. Doz.	$5.25	$9.00	$9.00	$9.00
No. 2. "	5.75	9.50	9.50	9.50
No. 3. "	6.25	10.00	10.00	10.00

LATHING.

BROAD.

Lathing.

Brands.	Collins.	Sharp.	Pecks.	Blair.
Dis., %	10	50, 5	50 & 5	60, 5
No. 1. Doz.	$4.75	$6.75	$8.00	$8.00
No. 2. "	5.25	7.50	8.50	8.50
No. 3. "	5.75	8.25	9.00	9.00

Broad.

Brands.	Collins.	Sharp.	Pecks.	Blair.
Dis., %	10	50	50	60, 5
No. 2. Doz.		$11.50	$11.00	$11.50
No. 3. "	7.50	13.00	13.00	13.00
No. 4. "	8.00	14.50	14.50	14.50
No. 5. "	9.00	16.50	16.50	16.50
No. 6. "	10.00	18.00	18.00	18.00

Broad Axes. Steel polls.

Brands.	Collins.	Hunt.	Sharp.	Pecks.
Dis., %	10	45	50	50 & 5
Dezen	$20.00	$30.00	$29.00	$32.00

YANKEE, OR OHIO. PENNSYLVANIA. NEW ORLEANS.

Brands.	Collins.	Sharp.	Pecks.	Blair.	Mann.
Dis., %	10	50	50 & 5	60, 10	50
Dozen	$19.00	$32.00	$32.00	$32.00	$32.00

Handled, extra, $4.

Adzes.

RAILROAD. Brands.	Collins.	SQUARE HEAD. Hunt.	Sharp.	SHIP CARPENTER'S Pecks.	Hurd
Dis., %	10	45	50	50	50, 50
Railr'd, heavy, doz.	$14.00	$26.00	$26.00	$26.00	$26.00
Flat head "	15.00	24.00	24.00	24.00	24.00

Brands.	Collins.	Hunt.	Sharp.	Pecks.	Hurd.
Dis., %	10	45	50	50	50, 100
Square head, doz.	$12.50	$24.00	$24.00	$24.00	$24.00

Brands.	Collins.	Hunt.	Sharp.	Pecks.
Dis., %	10	45	50	50
Ship Carpenter's or Spur Head, doz.	$13.00	$25.00	$25.00	$25.00

Brands.	Collins.	Hunt.	Sharp.
Dis., %	10	45	50
Cooper's, handled and bolted, doz.	$16.00	$27.00	$25.00

Axle Grease.

Frazer's (2-lb. tins), per gross. $18.00
2-lb. wooden boxes, " 12.00
Discount, 25 and 5 %.
Dixon's Everlasting, boxes 1 lb., per doz. $1.20
" " " 2 lbs., " 2.00

See Oils, page 10.

Bellows.

Miner's Bellows: 24 in., $8.50; 26 in., $9.75; 28 in., $11.00; 30 in., $11.25; 32 in., $13.50. 60 and 5% dis.

Standard, each: 18 to 24 in., $10; 28 in., $12; 32 in., $14; 34 in. $16; 36 in., $18; 38 in., $20; 40 in., $23; 42 in., $27; 44 in., $32 60 and 5% dis.

Hand Bellows, per doz.: 6 in., plain, $10; fancy, $20; 7 in., plain, $12; fancy, $24; 8 in., plain, $14; fancy, $28; 9 in., plain, $16; fancy, $32; 10 in., plain, $18; fancy, $36. 50% dis.

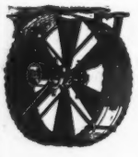
Belting.

LEATHER BELTS.
Standard Manufacturers List.
Single belts per foot.

Width.		Width.		Width.	
1 inch.	.10	6 inch.	.76	20 inch.	2.84
1¼ "	.13	7 "	.90	21 "	3.02
1½ "	.17	8 "	1.02	22 "	3.20
1¾ "	.20	9 "	1.15	23 "	3.37
2 "	.23	10 "	1.29	24 "	3.54
2¼ "	.26	11 "	1.42	26 "	3.92
2½ "	.30	12 "	1.55	28 "	4.30
2¾ "	.33	13 "	1.68	30 "	4.64
3 "	.36	14 "	1.82	32 "	5.00
3½ "	.43	15 "	1.98	34 "	5.35
4 "	.50	16 "	2.14	36 "	5.70
4½ "	.56	17 "	2.31	40 "	6.40
5 "	.63	18 "	2.49	44 "	7.10
5½ "	.70	19 "	2.66	48 "	7.80

Double belts twice the price of single.
Dis. single and double belts, cemented, 50 and 5%.
Dis. single and double belts, riveted and cemented, 50 and 5%.
Dis. single belts, cemented and lacesewn, water proofed, 50%.
Dis. double belts, cemented and lacesewn, water proofed, 45%.

Blowers and Disc Fans.

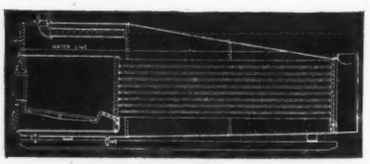


12 inches	$30	42 inches	$105
18 "	40	48 "	125
24 "	50	54 "	160
30 "	65	60 "	200
36 "	85		

Discount 35% and 2½ for cash.

Boiler (Scotch Flue).

Self-contained. Portable. Economical. Durable.



Horse power	8	10	15	20	25	30	35
Diameter	28"	32"	32"	36"	40"	40"	44"
Length, feet	9½	10	12¼	13¼	14¾	16¼	16¾
Weight, pounds	3500	4000	4500	5 00	6500	6900	7500
Price, $			387	487	580	634	767

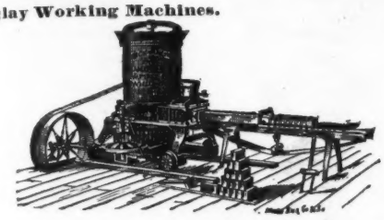
Horse power	40	45	50	55	60	70	80
Diameter, inches	44	48	48	52	52	56	56
Length, feet	17½	16½	18	17½	18½	18	19
Weight, pounds	8000	8500	8800	9500	10,000	11,000	12,000
Price, $	827	920	1027	1147	1227	1387	1500

Discount, 15%.

Brick Machinery.

Heavy Steam Power Machine	$525.00
Horse-Power Machines	300.00
Additional Horizontal Pugmill	225.00
Brick Moulds	$2.50 to $3.00
Brick Trucks	5.00 to 13.50
Brick Barrows	7.25
Brick Barrows with Springs	8.20
Sand Barrows, steel tray	6.40

Clay Working Machines.



	Capacity.	Price.
No. 20 A brick machine	60,000 to 80M	$3,500
No. 20 B " "	50,000	2,500
No. 15 D " "	40,000	1,800
No. 10 D " "	40,000	1,500
No. 15 S " "	30,000	1,400
No. 10 S " "	25,000	1,200
Upright stock brick machine	25,000 to 30M	1,200
No. 7 S brick machine	20,000	650
No. 6 S " "	15,000	575
No. 2 E " " H. P.	6,000 to 8,000	400

Brushes.

PAINT BRUSHES.
Intermediate prices not quoted.
Prices per dozen.

	No. 6.	4.	2.	0.	3-0.	5-0.	7-0.	Dis
X	$1.15	$1.80	$2.50	$3.15	$4.00	$5.25	$6.75	25%
Atlantic	1.25	2.15	3.80	5.25	7.00	10.00	13.00	25%
Standard	1.60	2.60	4.00	6.00	8.00	11.00	16.00	25%

VARNISH OVAL.

	No. 6.	4.	2.	0.	3-0.	5-0.	7-0.	Dis.
Globe	$1.15	$1.80	$2.50	$3.25	$4.60	$6.00	$8.00	25%
Crown	1.25	2.00	2.75	4.00	5.25	7.00	10.00	25%

VARNISH FLAT.

	No. 1.	1½.	2.	2½.	3.	Dis.
X	$0.48	$0.72	$0.96	$1.20	$1.40	25%

SASH BRUSH.

	No. 1.	3.	5.	7.	9.	Dis.
X	$0.25	$0.40	$0.60	$0.85	$1.20	25%
XX	0.40	0.75	1.10	1.40	2.00	25%

WHITE-WASH.

	No. 6.	7.	8.	Dis.
Brown	$1.25	$1.60	$2.00	25%
Pure	2.40	4.00	6.00	25%

SHOE.
Per gross.

8.	9.	25.	15.	26.	Dis.
10	$11.50	$12.50	$15	$18	25%

Per gross dis., 25%.

27.	32.	29.	35.
$20.00	$24.00	$28.00	$33.00

HORSE.
Patent.
Per gross, dis., 25%.

$18.00	$20.00	$24.00	$30.00

Per gross, dis., 25%.

Wood back	$12	$15	$18	$24
Leather back	$24	$31.50	$42	$54

SCRUB.
Patent.
Per gross, dis., 25%.

$12.00	$16.00

Per gross, dis., 25%.

$6.50	$8.50	$12	$14	$18

SHAVING.
Per doz., dis., 25%.

$0.36	$0.60	$1.00	$1.50	$2.50

COUNTER.
Per doz., dis., 25%.

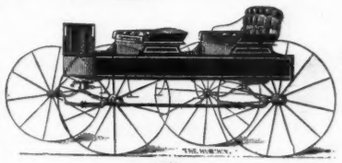
$2.00	$3.00	$4.00	$5.00

Carriages, Etc.

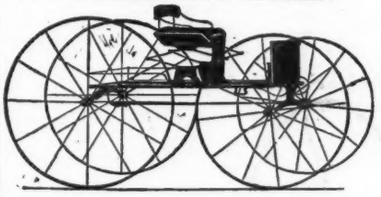
Windsor Surrey.
Open, $120.
Canopy top, $145.
Leather extension top, $185
Pole or shafts.

Cut under Surrey.
Canopy top, $185.
Leather extension top, $220

Brewster Spring. Open, $55. Rubber top, $76. Leather top, $100.



Runabout, $65.



Buckboard. $30; shafts.

No. 0. Cart, top and fenders	$150
No. 1. Cart, top and fenders	90
No. 2. Cart, one man cart, open	65
No. 2. Cart, one man, top	86
No. 2. Cart, one man, top and fenders	90
No. 3-H. Cart, two man, open	54
No. 4. Cart, two man, top	86
No. 5. Cart, two man, top and fenders	90
No. 6. Cart, two men, top and fenders	90
No. 7. Two man combination cart	110

Wide track 5 feet.
Narrow track 4 feet 8 inches.
Discount 33⅓ per cent. off.

Crucibles.

Battersea Crucibles, Triangular.

No.	Height. Inches.	Width. Inches.	Crucibles. Per doz.	Covers. Per doz.
S	4½	4½	$1.00	$0.50
T	4	3¾	0.80	0.50
U	3½	3¼	0.60	0.40
V	3¼	2⅞	0.45	0.40
W	2⅞	2⅝	0.35	0.30
X	2½	2¼	0.30	0.30
Y	2¼	2⅛	0.25	0.30
Z	1¾	1¾	0.20	0.30

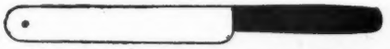
Battersea Muffles, any size, made to order.
See Illustration in advertisement.

No.	Long. Inches.	Wide. Inches.	High. Inches.	Price. Each.
A	7	3½	2½	$ .60
B	7½	4⅛	2⅞	.75
C	8	4¼	3	.85
D	8½	5	3¼	1.00
E	9	5½	3⅝	1.15
F	10	6	4	1.25
G	11	4	3½	1.00
H	10½	5¼	3⅞	1.00
J	12	6	4	1.25
K	14	8	5	1.75
L	15	9	6	2.00

Export discount 15 %.

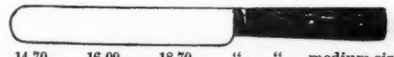
Cutlery.

KNIVES—TABLE.

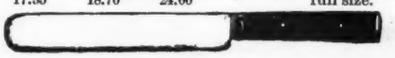


Japanned iron handles, $10.70 per gross pairs.

Cocobola handles.	Ebony handles.	Bone handles.	
10.70	12.00	15.35	gross pairs.

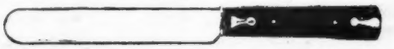


14.70	16.00	18.70	" "	medium size.
17.35	18.70	24.00	" "	full size.



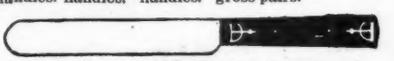
17.35	18.70	21.35	" "	medium.
20.00	21 35	26.70	" "	full size.

22.70 24.00 29.35 " "

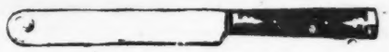


Cocobola handles.	Ebony handles.	Bone handles.	
27.35	28.70	36.00	

gross pairs.



28.00 29.35 38.00 " "

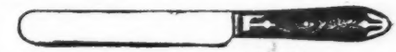


28.65 30.00 38.00 " "

28.65 30.00 38.00 " "

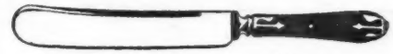
32.00 33.35 38.00 " "

34.70 36.00 48.00 " "



33.35 34.70 46.70 Gross pairs.

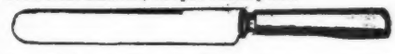
37.35 38.70 50.70 " "



40.00 41.35 53.35 " "

Hard rubber handles, 5.75 per dozen pairs.

Solid bone handles, 4.80 per dozen pairs.



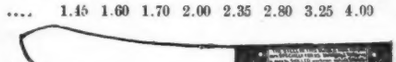
Celluloid handles, 7.35 per dozen pairs.
Forks are made to match all above patterns, with either three or four prongs.
Discount 25 %.

BUTCHERS'—COCOBOLA HANDLES.

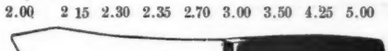
	Per dozen.								
4 and 4½ in.	5 in.	5½ in.	6 in.	6½ in.	7 in.	8 in.	9 in.	10 in.	
1.15	....	....	1.20	....	....	....	....	....	....

1.15 1.20 1.30 1.40 1.70 1.90 2.35 3.00 3.70 5.00

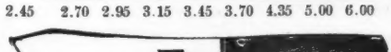
.... 1.45 1.60 1.70 2.00 2.35 2.80 3.25 4.00 .00



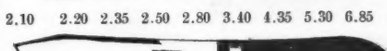
2.00 2 15 2.30 2.35 2.70 3.00 3.50 4.25 5.00 7.50



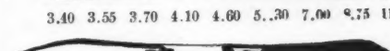
2.45 2.70 2.95 3.15 3.45 3.70 4.35 5.00 6.00



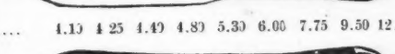
2.10 2.20 2.35 2.50 2.80 3.40 4.35 5.30 6.85 ....



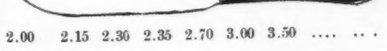
3.40 3.55 3.70 4.10 4.60 5..30 7.00 9.75 11.00



.... 4.10 4 25 4.40 4.80 5.30 6.00 7.75 9.50 12.50



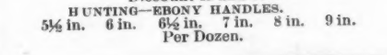
2.00 2.15 2.30 2.35 2.70 3.00 3.50 ....



Discount 25 and 10 %.

HUNTING—EBONY HANDLES.

5½ in.	6 in.	6½ in.	7 in.	8 in.	9 in.
Per Dozen.					



2.55 2.70 3.00 3.30 3.55 4.00 5.00 6.00

2.55 2.70 3.00 3.30 3.55 4.00 5.00

Discount, 25 and 10 %.

Per Dozen.

Putty knives, cocobola handles..... ..... $1.30@$1.50

SHEARS.

TAILORS'—JAPANNED OR NICKEL HANDLES.

	Per pair.		
12 in.....	6.00		
12½ in.....	7.00		
13 in.....	8.00		
13½ in.....	9.00		
14 in.....	10.00		
14½ in.....	11.00		
15 in	12.00	16 in.....	14.00

Discount, japanned, 60 %; nickle, 45 %.

BENT TRIMMERS.

	Per dozen.		
6 in.....	13.00	10 in.....	27.00
7 in	15.00	11 in.....	30.00
8 in	17.00	12 in.....	33.00
9 in	22.00		

STRAIGHT TRIMMERS.

	Per dozen,		
6 in.....	12.00	10 in.....	25.00
7 in.....	14.00	11 in.....	30.00
8 in.....	16.00	12 in.....	33.00
9 in.....	19.00		

LADIES' SCISSORS.

Per dozen.			
4½ in.....	10.00	6 in.	11.00
5 in.	10.00	6½ in.....	12.00
5½ in.....	10.50	7 in.....	13.00

PAPER AND BANKERS'.

Per dozen.			
9 in...	18.00	13 in....	36.00
10 in...	24.00	14 in....	42.00
11 in...	27.00	16 in....	54.00
12 in. .	32.00	18 in ..	20.00

BARBERS—Per dozen.

7⅞ in.....	15.00	9 in.....	18.00
8 in.....	16.00	9½ in.....	20.0
8⅛ in	17.00		

SCISSORS.

BUTTON-HOLE.

5 and 5½in., 14 00 per dozen.

Discount, japanned, 70 and 10 % nickel, 60 and 10 %

PRUNING.

1 B., 9 in., 24 per dozen; 2 B. 3½ in., 21; 3 B., 7¾ in., .9.80.

No. 110,

10 in.,

$30 per doz

Dis., 40 and 5%.

PRUNING SHEARS FOR LONG HANDLES.

No. 1, $36 per dozen; No. $30 per dozen.

Discount, 40 and 5%.

Cutters.

FEED

No. of cutter.	No. of knives.	Length in inches of knives.	Length in inches of feed cut.	Price.
1	2	6¼	⅛, ¾ and 1⅛	$18.00
2	2	7¼	⅛, ¾ and 1⅛	21.00
2½	1	7¼	⅝, ⅞, 1¼ and 1⅝	21.00
2½	2	7¼	⅛, ⅞ ⅝ and 1⅛	23 00
3	1	8½	⅝, ⅞, 1¼ and 1⅝	25.00
3	2	8½	⅛, ⅞ ⅝ and 1⅛	27.00
4	1	10	⅝, ⅞, 1¼ and 1⅝	30.00
4	2	10	⅛, ⅞ ⅝ and 1⅛	33.00
5	2	10	⅛, ⅝, ⅞ and 1¼	35.00
6	2	11	⅛, ¾, 1¼ and 2	45.00
6½	2	11	⅛, ¾, 1¼ and 2	45.00
7	2	13	⅛, ¾, 1¼ and 2	60.00
7½	2	13	⅛, ¾, 1¼ and 2	60.00
10	2	16	⅛, ¾, 1¼ and 2	80.00
12	2	20	⅛, ¾, 1¼ and 2	100 00
11	2	11	⅛, ¾, 1¼ and 2	45.00
13	2	13	⅛, ¾, 1¼ and 2	60.00
16	2	16	⅛, ¾, 1¼ and 2	80.00
20	2	20	⅛, ¾, 1¼ and 2	100.00

The knife arbors for all sizes are made of machinery steel. 30 per cent. dis.

VEGETABLE—GALE'S.

Size.	Weight of Fly Wheel. Pounds.	Will cut per hour. Pounds.	Price
No. 1½	20	1,500	$12
No. 2½	32	1,700	15
No. 3½	32	1,700	15
No. 4	42	2,000	18
No. 5	50	3,000	25
No 10	65	8,000	35

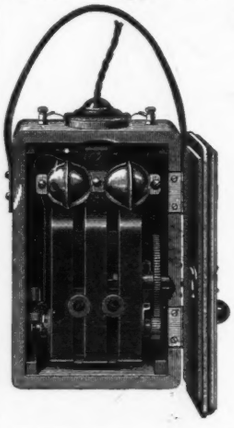
30% dis.

Drill—Portable Hand Rock.

Price, $225.

Dis., 25 and 2½%.

Electrical Appliances.



20,000 ohm Testing Generator..... $10.00

Pony Magneto Bell..... 6.00

Standard Magneto Bell 7.50

Standard Extension Bell..... 4.00

Pony Extension Bell..... 3.00

Discount 40 per cent.

Electroplate.

	Extra plate, per doz.	Double plate, per doz.	Triple plate, per doz.
Oyster forks.....	7.00	9.00	11.00
Sugar shells.....	9.00	11.00	13.00
Sugar tongs.....	25.50	31.50	37.50
Butter knives, twist or reversed handles.....	10.50	12.50	14.50
Nut picks.....	4.75	6.00	7.25
Pie knives, engraved blades.	42.00	51.00	60.00
Soup ladles	48.00	60.00	72.00

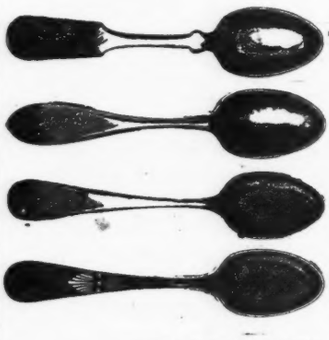
Dis. 60 and 2%. Aesthetic medium fork.

Tea spoons.	Table spoons.	Medium forks.
7.50	15.00	15.00 per gross.

Discount, 30 and 5 %.

	3 pcs.	4 pcs.	
Children's sets *on cards*.			
Leader pattern, as per cut....	21.00	24.00 doz.	60 and 5 %
Aesthetic pattern, as per cut..	5.75	7.25 doz.	30 and 5 %

SPOONS, FORKS, ETC., BEST PLATE ON HARD WHITE METAL



Tipped Tea Spoon.

Oval Tea Spoon.

Perfect Tea Spoon.

Leader Tea Spoon.

	Tipd	Oval.	Perfect and Leader.
	5 oz. or extra plate		
Tea spoons.	4.25	4.50	4.75 per doz
Dessert spoons.	7.50	8.00	8.50 " "
Table spoons...	8.50	9.00	9.50 " "
Coffee spoons...	4.25	4.50	4.75 " "
Dessert forks...	7.50	8.00	8.50 " "
Medium forks..	8.50	9.00	9.50 " "

Discount, 60 and 5%.

Spoons and forks, German silver, tipped pattern.

Tea spoons.	Table spoons.	Medium forks.
22.50	45.00	45.00 per gross.

Discount, 60 and 2½%.

Spoons and forks, made from brass, and silver plated a coating of hard, white nickel.

CASTERS.

1,200—Dinner. Dis., 60 and 5%.

232—Breakfast.

No. 146.

PICKLE DISHES

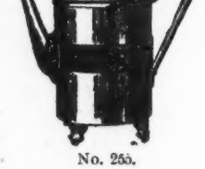
No. 144. 12 in. high, $3.50

No. 66. 10½ in. high, $2; assorted colored glass.

No. 155. 12 in. high, $4; assorted colored glass.

No. 146. 12½ in. high, $9; hand decorated glass.

No. 156. 12½ in. high, $6; hand decorated glass.



No. 255.

TEA SETS.

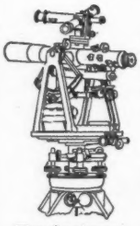
No. 255. 6 pieces, $35, quadruple plate.

No. 301. 4 pieces, $23, quadruple plate.

No. 1847. 6 pieces, $42, quadruple plate.

Dis., 60 and 5%.

Engineering Instruments.



Full Engineer's Standard Transit.

7 in. graduated circle $255

6 in. " " 245

5 in. " " 235

4 in. " " 225

Standard Engineer's Level, Improved centre and seat attachment, 18 in. telescope 140

Plain railroad level, 18 in. telescope..... 125

Dis., 5%.

Explosives.

Dynamite, 75% Nitro-Glyceine, per lb..... .32

" 60% " " " ..... .25

" 40% " " " ..... .20

Blasting powder A, per keg 25 lbs..... $2.40

" B, " " " 1.90

Sporting powder, standard brands, per keg 25 lbs... 5.00

" " " " " 12½ lbs. 2.75

" " " " " 6¼ lbs. 1.50

" " high grades " 6¼ lbs. 3.00

" " " " per can 1 lb.... 60

" " fancy brands " 1 lb.... 1.00

Discounts special for quantity.

Safety fuse, cotton, 12 M ft. in case..... $2.85 per M ft.

" " single tape, 6 M ft. in case.... 3.85 " "

" " double tape " " .... 4.85 " "

" " triple tape " " .... 5.60 " "

Discount 17½%.

Detonating caps, triple force, 25 M. in case..$5.00 per M.

" " quintuple force, 25 M. in case..... 7.50 per M.

Electrical exploders, 4 ft. wires..... $3.00 per 100

" " 6 " ..... 3.54 "

" " 8 " ..... 4.08 "

" " 10 " ..... 4.62 "

Discount 15%. Long lengths to order.

	No.	Capacity.	
Magneto Blasting Machines....	1 V.	8 holes	$17.00
" " "	2 V.	20 "	25.00
" " "	3 L.	20 "	25.00
" " "	3 V.	30 "	30.00
" " "	4 V.	60 "	50.00

Discount 15%.

Blasting cables..... $5.00 each, discount 40%

" reels..... 5.00 " " 20%

louring Mill Machinery.

20-inch New Era Mill for Wheat, Corn, and Middlings.

Size.	Power.	Pulley.	Capacity
Inch.	H. P.	Inch.	Bush.
20	4 to 10	14 × 7	12 to 40

Speed.	Weight. Lbs.	Price.
500 to 800	660	$150

Farm and Plantations Mills.

Diameter of burrs.	Power to drive.	Size of pulley.	Capacity per hour.	Revolutions per minute.	Weight.	Price
	H. P.					
14 in.	2 to 4	9×5½	4 to 14 bushels.	600 to 1200	370 lbs.	$100
18 in.	4 to 10	11×6½	8 to 40 bushels	400 to 700	600 lbs.	130

The Dixey Mill—Stiff Spindle Style.

Size.	Power.	Capacity.	Weight.		Pulley.	Iron gear.	Mortise gear.
			Pulley.	Geared			
18	4 to 6H.P.	8 to 25 bu	560 lbs	650	$130	$165	
22	6 to 8 "	12 to 30 "	800 "	1000	165	200	
26	8 to12 "	16 to 40 "	1100 "	1500	185	220	
30	10 to15 "	25 to 60 "	1300 "	1700	215	255	

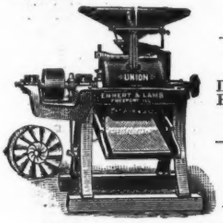
GRINDING MILLS.

"Daisy," without Shaking Bolt, 170 pounds, 9 cubic feet, $40.

"Daisy," with Shaking Bolt, 185 pounds, 9 cubic feet, $48.

Discount 25 per cent.

"The Union Mill."



Diameter of Buhr Stones	Size of Pulleys	
	Diam.	Face.
12 in.	8 in.	6¼ in.
16 "	9 "	7½ "

Horse Power	Capacity in B'sh's	Speed	Without Bolt	With Bolt	Sacking Elevator, Extra	Extra Metal Buhrs
8 to 10	12 to 30	1200 to 1500	$90.00	$105.00	$15.00	$1.20 pair
10 to 15	20 to 50	1000 to 1600	160.00	178.00	17.50	1.50 "

NOISELESS ROLLER MILLS FOR FLOUR MILL USE.

4-roll or double machines.

Size, inches.	Weight, lbs.	Price in New York, net. All smooth.	1 pair smooth, 1 pair corrugated.	All corrugated.
6×12	1,480	$302	$307	$312
6×16	1,680	334	339	344
6×20	1,860	3 7	372	377
9×14	2,800	377	383	390
9×18	3,500	406	414	422
9×24	4,150	455	466	477
9×30	5,850	510	525	539

NOISELESS ROLLER MILLS FOR CORN-GRINDING ONLY.

Size inches.	Weight lbs.	Capacity per hour bushels.	Price in New York.
9×14	2,600	20 to 35	$390.
9×18	3,050	30 " 50	422.
9×24	3,350	40 " 80	477.

6×8 Corn Meal Roller Mill.....$85.

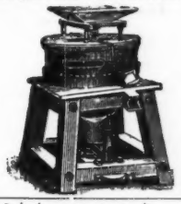
COMPLETE FLOUR MILLS ON MILLSTONE SYSTEM.

Size of stone ins.	Power needed.	Capacity flour per hour lbs.	Weight boxed.	Price net in New York
20	6 h. p.	200	4,000 lbs.	$550.
26	7 "	250	4,500 "	650.
30	10 "	300	5,500 "	750.
36	11 "	375	6,500 "	850.
42	12 "	450	8,000 "	950.

COMPLETE FLOUR MILLS ON THE ROLLER PROCESS.

Capacity in flour 24 hours.	Power needed.	Weight approx. in lbs.	No. of estimate.	Net price in New York.
25 bbls.	20 h. p.	14.000	15	$2,200
40 "	22 "	22.000	D	2,400
50 "	25 "	32,000	C	3,200
75 "	35 "	48,000	B	4,700
100 "	45 "	60.000	A	5,500

The Nordyke Bradford Portable Mill.

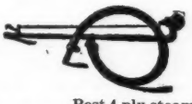


Size of stones. In.	Grinding capacity. Corn, bu. per hour.	Wheat bu. per hour.	Horse-power.	Weights. Sing'l gear.	Double gear.	Pulley mill.	Geared mills. Iron wh'ls.	Mortise wh'ls.
18	8 to 10	.....	4	550	625	$130	$165	$180
20	10 to 12	.....	5	600	700	140	175	190
22	12 to 15	.....	5	700	850	160	190	210
24	15 to 18	.....	6	900	1050	175	210	225
26	18 to 20	8 to 10	8	1200	1400	185	225	250
30	20 to 25	10 to 12	10	1500	1700	225	255	290
36	25 to 30	14 to 17	12	1800	2100	315	355	380
42	35 to 40	19 to 21	15	2000	2300	390	435	460

Driving pulley.	Revolutions per minute.	Length of belt above floor.	Approximate shipping weight	Price.
10″ × 5¼″	400 to 500	14′	.....	$500.00
14″ × 6¼″	350 to 450	18′	2600 lb.	600.00
14″ × 7¼″	350 to 450	18′	3050 lb.	650.00
14″ × 8¼″	350 to 450	18′	3350 lb.	735.00

Flue Cleaner.

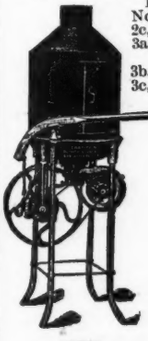
Hurley's Automatic Steam Flue Cleaner.



No.	Outside diam. of tubes.	With hose clamps.	Globe Valves.	Best 4-ply steam hose. Per foot.
1	1⅛ to 2	$5.00	⅛, 95 cents	¾, 67 cents.
2	2 to 2½	6.25	⅛, 95 cents	¾, 67 cents.
3	2½ to 3	7.50	¼,$1.30	¾, 67 cents.
4	3 to 3½	8.75	1, 1.75	1¼, 83 cents.
5	3½ to 4½	10.00	1¼ 2.90	1¼,$1.04

Dis. on flue cleaners, 60 an 1 70%.
Dis. on steam hose, 50%, good to 90 lbs steam.

Forges (Portable).



No. 2c, weight, 155 lbs. 21×27 hearth ..$42.00
3a, " 80 " 18 in. diam. hearth..... 27.00
3b, " 75 " 18 " 24.00
3c, " 85 " 18 " 30.00
No. 6a, weight 45 lbs., 14 in. diam. hearth..... 18.00
No. 6B, weight 45 lbs. 14 in. diam. hearth..... 16.00
Dis. 60%.

Light work, 12 × 17; height, 15 in., $16.00.
Same, with Hood, 12 × 17; height, 28 in., $20.00.
Bridge, Boiler or Railroad work, Pan, 17 × 19; height, 29 in.; Fan, 8 in., $27.00.
Same, with Hood, $30.00.
Water Tank, $4.00 extra.
Iron Fire Ring Round Tuyere, $1.00 extra.
50 % dis.

No. 1, 18 in. bellows, $20; No. 2, 20 in. bellows, 25; No. 3, 22 in. bellows, $30.
20% dis.
Stationary.
27 in. bellows, $21; 30 in. bellows, $25; 33 in. bellows, $33; 36 in bellows, $45.
2 % dis.

Riveting Forges.
Bellows, 18 in., 20 in., 22 in., 24 in.
$8.00. $10.00. $13.00. $17.00
20 % dis.

Fruit Evaporator.

No. 1. Evaporator..... $30
No. 2. Fruit Drier and Baker, with Bleacher attachment. Weight, 225 lbs. Capacity, 5 to 7 bushels apples per day; 24 in. deep, 26 in. wide, 5½ ft. high; 12 trays, 22 × 22; 40 square feet drying surface. Complete..... $50
No. 3. Capacity, 15 to 20 bushels per day..... 100
No. 4. Capacity, 20 to 30 bushels per day..... 165
Dis., Nos. 1 and 2 = 25%. Nos. 3-4 = 20%.
Boxing, extra:
No. 1, $3.00; No. 2, $5.00; No. 3, $7.50; No. 4, $12.50.
Freight to New York:
No. 1, $4.00; No. 2, $6.00; No. 3, $12.00; No. 4, $18.00.

Gaskets.

Corrugated Copper.

Price, 2 cents per square inch, less 30 per cent. discount for home trade.
Less 60% discount for export trade.

Glass Tube Cutters.

One Arm Carries Rotary Cutter Price, $2.50 each.

Glassware.

6-in. bowl and cover, per doz.....$3.25
7-in. " " " 4.50
8-in. " " " 6.00
9-in. " " " 8.00
10-in. " " " 10.50
Net.

Nappy, 4½-inch., per doz., 50c.; 6-inch., per doz., $2 nch ., per doz., $3; 8-inch., per doz $4.
Cream Pitcher, 1 pint, per doz., $1.25; one quart, per doz., $3.50; 3 pints, per doz., $4.50.
Pint Pitcher, per doz., $1.50; quart pitcher, per doz., $2; ½ gallon pitcher, per doz., $3, 3 quart pitcher per doz., $4.50.

Flange Butter and Cover, per doz., $1.75.
Water Set, perdoz., sets of 60 pieces, $7.50.

Cheese Dish and Cover, 8 in. per doz., $4.50.
Quart Water Bottle, per doz., $4.50.
Ind. Salts; per gross, $2.00. Assorted patterns.
4 Bottle Castors, per doz., $7.50; 3 bottle, per doz., $4.50.

Berry Dish, 4½-inch , per doz., 50c.; 10-inch, per doz. $4.
Butter Dish and Cover, per doz., $1.25.
Butter Dish and Cover, per doz., 75c.

Candlesticks, per doz., $2.00. Glass Slipper for Flowers, per doz., 50 cents; slipper and tray, per doz., $1. Jam Jar and Cover, 1 qt., per doz., $2.50; ½ gal., per doz., $3.25; ¾ gal., per doz., $4; 1 gal., per doz., $5; 1½ gals., $9; 2 gals., per doz., $12. Pocket Flask, 1 pint, $1.

Tumblers. 1⅝ oz., per doz., 50 cents.
8 " " 75 "

9 oz., per doz., $2.75.

11 oz., assorted patterns, per doz., 30 cts.

9¼ oz., assorted patterns, per doz., 25 cts.

1 oz. to 12 oz., nested for shipping, per doz. nest, $2.

Goblets, banded, per do 65 cents.
Claret to match, per doz., 55 cents.
Wines, to match, per doz., 50 cents.
Cordials, to match, per 45 cents.

Goblets, per doz., 50 cts.
Claret, " 50 "
Wine " 35 "

Banded, open, hollow stem.

Champagne, per doz., $1.25.

½ Pt. tumbler, per doz..55 cts.
½ Pt. mug to match, " ..65 "
Goblet, " " ..50 "

Spoon holder, cream pitcher, sugar butter dish to match.

Sets of 4 pieces, per doz. sets, 48 pieces, $3.75.

Hand Carts

No. 0 42 wheel in. tread, 1 in. axle-box 48x28x10 deep, $10.50.
No. 1, 36 wheel, 1 in. tread, ⅞ in. axle, box 40x23x10 deep, $9.00.
No. 2, 30 wheel, ¾ in tread, ¾ in. axle, box 32x20x9 deep, $8.25.

With Wagon-Seat Spring.
No. 6, same sizes as No 0.....$12.00
" 7, same sizes as No. 1..... 10.50
" 8, " " " No. 2..... 9.75

With Third Wheel, Without Springs.
No. 3, same sizes as No. 0.....$12.00
" 4, " " " No. 1..... 10.50
" 5, " " No. 2..... 9.50

Hardware Specialties.

AUGERS.

Patent Adjustable Hollow. No. 3.

Cuts from ¼ to 1¼, pivoted jaws, graduated scale to 1-16ths, per doz., $60.00

Discount, 15 and 10%.

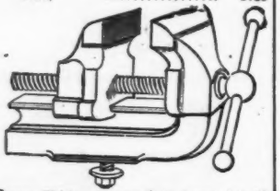
Patent Hollow Auger. No. 6.

inch.....	5-16	⅜	7-16	½
With bits....	12.00	12.00	12.00	12.00
Without bits	8.00	8.00	8.00	8.00
9-16	⅝	¾	⅞	1	1⅛
14.00	14.00	14.00	16.00	16.00	20.00
9.00	9.00	9.00	13.00	13.00	14.00
1¼	1⅜	1½			
20.00	24.00	24.00			
14.00	16.00	15.00			

Discount, 15 and 10%.

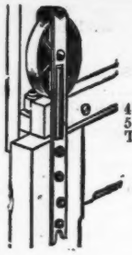
BENCH DRILL.

Adjustable bed plate. 26½ high drills to ½ in. hole, 3½ run of screw.
List price, each.....$10.00
Net, " 4.25



Bench Vise, Steel Jaws, 3½ in., opens 3 in.; weight, 12 lbs.; list price, each, $4.00.; net price, each, $1.60.

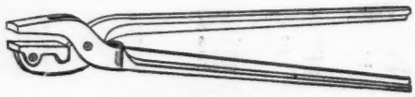
BENCH HOOK.
Patent, adjustable and reversible
List $9 dozen, ½ dozen in box.
Discount, 30 and 10%.



BARN DOOR HANGER.

4 in., per doz. pairs	$12.00
5 " " "	14.40
Track, per foot	.08

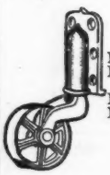
One dozen pairs in case.
Dis., 50 and 10%.



BLACKSMITH'S TONGS.
Swivel Jaw.

No. 1, 16 in., per doz.	$10.00
" 2, 18 " "	10.00

Dis. 20 and 10%.



CASTERS.
Swivel Store Truck

No. 20, japanned, 4 in. wheel, each		.55
No. 25,	5 " " "	.75

Noiseless turned wheel.

No. 30, japanned, 4 in. wheel, each		1.30
No. 35,	5 " " "	1.60

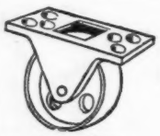
Discount, 60%.

CLOTHES REEL.
Extra heavy, gray iron, japanned.
List per doz.....$15.00
Net 7.00

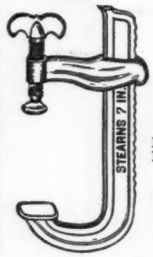
JACK SCREWS.
New pattern wrought iron screw.

No.	Rise of screw.	High.	Diameter screw.	Price.
20	4½ in.	10 in.	2 in.	$4.50
25	6½ "	12 "	2 "	5.25
30	8½ "	14 "	2 "	5.75
35	11½ "	16 "	2 "	6.50

Discount, 40%.



Store Truck, stationary.
No. 50, 5-inch wheel, 1½ inch wide each, $1.05.
No. 60, 5-inch, extra heavy, 1½ inch wide, each $1.50.
Discount, 25%.

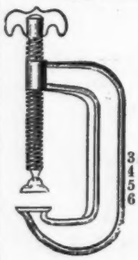


SCREW CLAMPS.
Adjustable.

3 in., per doz		$4.00
5 "	"	6.50
7 "	"	9.00
9 "	"	10.50
12 "	"	15.00
16 "	"	20.00

½ doz. in box.
Discount, 20 and 10%.

CLAMPS.
New Door Frame.
3 ft. long, per doz., $8 list; $5 per doz. net.



Malleable Iron Screw Clamps.

Per Doz.		Per Doz.	
3 in	$7.00	7 in	$20.00
4 "	10.00	8 "	25.00
5 "	12.00	9 "	27.50
6 "	16.00	10 "	30.00

3, 4, 5, 6 in., ½ doz. in box.
Dis., 70%.

WINDOW SCREEN FRAMES.
Patent Japanned Corners.
No. 25, 36 by 36 corners and screws, without bead, per doz., $2.50.
No. 25, 36 by 36 corners and screws, with bead, per doz., $2.90.
No. 35, 42 by 42 corners and screws, without bead, per doz., $2.90.
No. 35, 42 by 42 corners and screws, with bead, per doz., $3.30.
Black satin stain, sticks ⅞ by 1 in. Dis., 25, 10 and 5%.

PULLEY HOOK (New Floor.)
Deep cut thread, forged point.

	Per doz.
¾ in. wrought iron, 8 in. long, list	$1.90
net	1.00

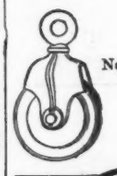
WELL WHEEL.
New pattern.
Japanned.

In.	8	10	12	14	16
Pr.d.	7.00	9.50	12.50	20.00	30.00

Discount, 70%.

PULLEYS.
Side, No. 45, Japanned.

Inches...	1	1½	2	2½	3	4	5
Per doz..	.90	1.00	1.60	2.40	3.50	9.00	15.00

2 inch and under, 2 dozen in box: 2½, 3 and 4, 1 dozen in box; 5 inch, ½ dozen in box.
Discount, 70%.

HAY FORK PULLEY.
New pattern.

No. 15, 5 in. iron wheel	per doz.	$4.00
25, 5 in. wood	"	4.50
66, 6 in. "	"	6.00

4 dozen in case, 8 dozen in barrel.

No. 15, per dozen, $1.75 net.

SHEAVES.
Patent Common
Turned and polished iron wheels, round corners, brass pin, one set in box.

2½ inch	$1.50
3 "	1.80
4 "	2.00
5 "	2.60

Discount, 60%.

SINKS.
All 6 inch deep.

14 × 20 in....	$1.50	18 × 30 in....	$2.50
15 × 25 in....	1.75	18 × 32 in....	3.00
15 × 27 in....	2.00	18 × 36 in....	3.00
16 × 24 in....	1.80	20 × 30 in....	3.00
16 × 28 in....	2.10	20 × 36 in....	3.70
17 × 30 in....	2.25	20 × 40 in....	4.00
18 × 24 in....	2.10		

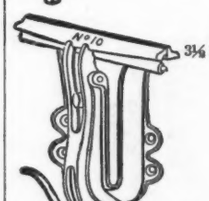
Discount, 60 and 10%.

SPOKE POINTERS.

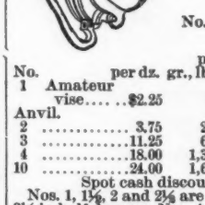
Per doz.
No. 1, points 1⅞ in. diameter, $9.00
No. 2, points 2⅝ in. diameter, $15.00

Discount, 15 and 10%.

½ dozen in box.



VISE.
(Bench Vise, Steel Jaws.)
3½ in. opens 5 in., weight 12 lbs.
List price, each..$4.00
Net " " .. 1.60



Silent Saw Vise.
No. 10., 10 in. jaw, per doz....$15.00
Dis., 33⅓%.

No.	per dz.	gr., lbs.	No.	per dz.	gr., lbs.
1	Amateur vise.....	$2.25	70	Clamp. 1¼.....	3.00	80
				2½.....	5.00	220
Anvil.				3½.....	14.25	700
2	.....	3.75	200	4½.....	21.00	1,425
3	.....	11.25	615	Combination		
4	.....	18.00	1,350	hand.....	5.25	85
10	.....	24.00	1,675			

Spot cash discount, 33, 20 and 2, f.o.b.
Nos. 1, 1½, 2 and 2½ are packed in dozens; Nos. 3 and 3½ in half dozens; Nos. 4, 4½ and 10 in quarter dozens, and No. 20 singly. Each hand vise is put up in neat box and packed in half dozen lots.

1 Hinge pipe vise, 0 to 2 in. pipe.....Each $10.00
2 " " " 0 to 4 in. pipe..... 20.00
1 Malleable pipe vise, 0 to 2 in. pipe..... 8.00
1 Combination pipe and bench vise, 0 to 2 in. pipe... 16.00
Discount, 50%.

WRENCHES.

Coes Wrenches.

BLACK.
Knife Handle.

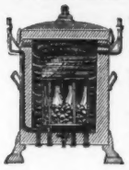
Size.	₱ doz.	Size.	₱ do		₱ doz.
6 inch.....	$9.00	10 "	12.00	15 inch.....	24.00
8 "	10.00	12 "	14.00	18 "	30.00
21 inch.....			36.00		

BRIGHT.
Knife Handle.

4 inch.....	$10.00	10 inch.....	14.00	18 inch	32.00
6 "	10.00	12 "	16.00	21 "	38.00
8 "	11.00	15 "	26.00		

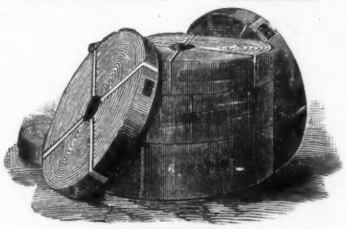
Discount, 55, 10, 7½ and 3 %.
Coes Mechanics' Screw Wrenches, same list, less 50, 10, 10, 7½ and 3 %.
Patent Screw Wrench, same list. Dis. 50, 10, 7½ and 3%.

Ice Machines (Family).



No. 1, Ice machine, ice and ice cream molds, 1 lb. ice, $15.00.
No. 2, Ice machine, ice and ice cream molds, 1½ lbs. ice, $20.00.
No. 3, Ice machine, ice and ice cream molds, 1 carafe 1 bottle holder, 2 lbs. ice, $26.50.
No. 4, Ice machine, ice and ice cream molds, 2 carafe 1 bottle holder, 4 lbs. ice, $33.00.
No. 5, Ice machine, ice and ice cream molds, 3 carafe 1 bottle holder, 6 lbs. ice, $40.00.
No. 6, Ice machine, ice and ice cream molds, 4 carafe, 1 bottle holder, 9 lbs. ice, $46.50.
No. 7, Ice machine, ice and ice cream molds, 5 carafe, 1 bottle holder, 12 lbs. ice, $60.00.
Siberia, 18 lbs., $120. Dis., 20 and 10%.

India Rubber Goods. MECHANICAL.



RUBBER BELTING.

Inches.	2 ply per foot.	3 ply per foot.	4 ply per foot.	5 ply per foot.	6 ply per foot.
1	$0.07	.....	.....	.....	.....
1¼	0.09	.....	.....	.....	.....
1½	0.11	.....	.....	.....	.....
2	0.15	$0.17	$0.21	.....	.....
2½	0.18	0.22	0.26	.....	.....
3	0.22	0.26	0.31	.....	.....
3½	0.26	0.30	0.37	.....	.....
4	0.30	0.34	0.42	.....	.....
4½	0.33	0.39	0.47	.....	.....
5	0.36	0.43	0.52	.....	.....
6	0.43	0.52	0.62	.....	.....
7	0.51	0.60	0.73	.....	.....
8	0.59	0.70	0.84	$1.05	$1.25
9	0.67	0.80	0.95	1.18	1.42
10	0.75	0.90	1.07	1.33	1.60
11	0.83	1.00	1.18	1.47	1.77
12	0.91	1.08	1.30	1.62	1.95
13	1.00	1.18	1.42	1.77	2.13
14	1.08	1.28	1.54	1.92	2.31
15	1.16	1.38	1.66	2.07	2.49
16	1.25	1.50	1.78	2.22	2.67
18	1.41	1.70	2.02	2.52	3.03
20	1.58	1.90	2.26	2.82	3.39
22	1.76	2.12	2.52	3.15	3.74
24	1.96	2.36	2.80	3.50	4.20
26	2.18	2.60	3.08	3.85	4.62
28	2.42	2.84	3.36	4.20	5.04
30	.....	.....	3.64	4.55	5.46
32	.....	.....	3.92	4.90	5.88
34	.....	.....	4.20	5.25	6.30
36	.....	.....	4.48	5.60	6.72
38	.....	.....	4.76	5.95	7.14
40	.....	.....	5.04	6.30	7.56
42	.....	.....	5.32	6.65	7.98
44	.....	.....	5.60	7.00	8.40
46	.....	.....	5.88	7.35	8.82
48	.....	.....	6.16	7.70	9.24
50	.....	.....	6.44	8.05	9.66
52	.....	.....	6.72	8.40	10.08

Dis. Reliance, 60 and 5. Dis. Royal, 60, 10 and 10. Dis Manhattan, 70 and 5. See Leather Belting, page 3; Link Belting, page 9.

PACKING.

Piston Packing.
Round Piston Packing Per lb. 85c.
Discount, 60, 10 and 5 per cent.

Square Piston Packing.
Price same as above. Round and square piston packing is made in lengths of twelve or twenty-four feet.

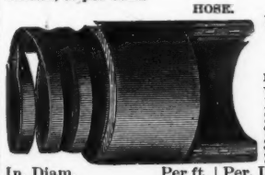
Square Piston Packing. Rubber back, per pound $1. Discount 60 per cent. Best only.
Square piston packing rubber back is made in engths of twenty feet.

Steam Packing.
Cloth Insertion, Rubber Outside.
Cloth Insertion, Cloth on one or both sides.

Thickness.	1-Ply.	2-Ply.	3-Ply.	4-Ply.
1-64 inch	70 cts.	.....	.....	.....
1-32 "	65 cts.	.....	.....	.....
1-16 "	60 cts.	63 cts.	66 cts.	.. ....
3-32 "	55 cts.	58 cts.	61 cts.	.....
1-8 "	55 cts.	55 cts.	58 cts.	61 cts.
3-16 "	55 cts.	55 cts.	55 cts.	58 cts.
1-4 "	55 cts.	55 cts.	55 cts.	55 cts.

One-ply of cloth to every 1-16 inch thickness.
Three cents per pound additional will be charged for each extra ply of cloth. Each cloth, whether insertion or on outside, to count as one ply.
All cloth insertion or plain packing is one yard wide, and any length desired.
Wire insertion packing, all thicknesses, per lb, 50 cents.
Discounts: Reliance, 70 & 10; Royal, 60, 10 & 10: Manhattan, 60 per cent.

HOSE.



Improved "Smooth Bore" Rubber Suction Hose.
On spiral flat or round tinned steel wire.

Int. Diam.	Per ft.
2 inch	$2.60
2½ "	3.50
3 "	4.00
3½ "	5.50

In. Diam.	Per ft.	Per. Diam.	Per ft.
inch	6.50	7 inch	$13.50
4½ "	7.50	7½ "	15.00
5 "	8.50	8 "	16.50
5½ "	9.50	9 "	19.50
6 "	10.50	10 "	22.50
6½ "	12.00	12 "	27.50

Suction hose discount: Reliance, 50 and 10%; Royal, 60, 10 and 5%; Manhattan, 70 and 5%.

SUCTION HOSE.

On spiral brass or iron wire

Int. Diam.	Per. ft.
¾-inch	$ .77
1 "	1.00
1¼ "	1.25
1½ "	1.65
1¾ "	2.10
2 "	2.50

RUBBER HOSE.
Conducting Hose—Two-ply.

Int. diam.	Per ft.	Int. diam.	Per ft.	Int. diam.	Per ft.
½ in	$0.20	2 in	$0.66	5 in	$1.65
¾ in	25	2¼ in	75	6 in	1.98
1 in	33	2½ in	83	7 in	2.31
1¼ in	42	2¾ in	92	8 in	2.64
1½ in	50	3 in	99	9 in	2.97
1¾ in	58	4 in	1.32	10 in	3.33

HYDRANT HOSE—THREE-PLY.

½ in	$0.25	1½ in	$0.60	2½ in	$1.00
¾ in	30	1¾ in	70	2¾ in	1.10
1 in	40	2 in	80	3 in	1.20
1¼ in	60	2¼ in	90	3½ in	1.40
				4 in	1.60

Discount—Reliance, 60; Royal, 70; Manhattan, 70 and 10 per cent.

GASKETS AND RINGS.

Fibrous.
⅛ inch thick, or less, per lb $0.90
5-32 inch thick, and upwards, per lb $0.80
Cloth Insertion.
1-16 inch thick, or less, per lb $1.25
3-32 inch thick, and upwards, per lb $1.00
There is one ply of cloth to every 1-16 in thickness.
Five cents per pound additional for each extra ply of cloth. Dis., 60, 10 and 5%.

CORRUGATED RUBBER MATTING.

Rolls 1 yard wide, 30 yards long, cut to any size required.

Indurated Fibre Ware.

SPITTOONS.

	Doz.
16 in. dia., 8 in. high	$24.00
12½ in. dia., 5½ in. high	10.80
9 in. dia., 5 in. high	7.80

WASH TUBS.

No. 0, 23 in.	½	12	27.00
Nos. 0, 1, 2 and 3, nested	1	n. 3½	22.50
No. 1, 21 in.	½	10½	24.00
No. 2, 19½ in.	½	9	21.00
No. 3, 18½ in.	½	9	18.00
Nos. 1, 2, and 3, nested	½	9¾	21.00

CHAMBER PAILS.

12 in. dia., 9 in. deep, 3 gal. 16.00

WATER COOLERS.

	Doz.
3 gal	$32.00
4 "	40.00
5 "	44.00
6 "	48.00
8 "	64.00
10 "	80.00
12 "	96.00
15 "	120.00

Dis. on all 40%

Pails.

	No. doz. in crate.	Cubic feet.	Price per doz.
Ladies' or Weaver's pails, 6 qt	1	2¾	$5.35
Half or buggy pails, 8 qt	1	3	4.80
Star pails (standard plain), 12 qt., stenciled "for fire only" without extra charge	1	3½	6.00
Deck or Mason's pails (same size as Star, but heavier, with heavy wire bail)	1	4	6.60
Railroad or fire pails, 14 qt. (also stenciled "fire" without extra charge)	½	3	7.80
Fire pails, round bottoms	1	4	7.80
Milk pails, 14 qt	1	4	7.80
Stable pails, flush bottom, heavy wire bail, 14 qt	1	4	7.80
Stable pails, 16 qt., same as above	½	3½	8.40
" 18 " "	½	3¾	10.70
" 20 " "	½	4	12.00
Covers for fire or star pails		1	3.35

KEELERS.

		Doz
A—20 in.	7 in. deep	16.20
B—19 "	" "	15.00
C—18½ "	" "	14.00
1—17½ "	" "	13.20
2—15½ "	6 in. "	12.00
3—13½ "	5 in. "	10.20
4—12 "	4 in. "	9.00

MILK OR VEGETABLE PANS.

13½ in. dia 3¼ in. deep, 6 quarts, $3.60 per doz.

WASH BASINS. Doz.

12½ in $3.60 4.20

Lamps.

Drummond Electric Hanging Lamp, 300 candle power, complete, each $3.50.
The electric lamp, 60 candle-power.
With decorated shades, nickel, per doz $22.00
With opal plain shades, nickel, per doz. 18.00.
With decorated shades, brass, per doz. 21.00.
With opal plain shades, brass, per doz. 17.00.
" Lamp chimney patent for Sun burners. Per doz. No. 0, 50 cents. No. 1, 60c. No. 2, 75c.
Hitchcock nickel table lamp (No. 654), each $3.25
" " hanging " 656 " 7.25
" " bracket " 651 " 3.50
" " " with reflector 653 " 3.75
" French bronze bracket, with reflector, No 653, each $3.75.

Miners'.
Brass, Collar and Breast in one piece, Spout and Body in one piece.
Price, $8 per gross net.

	Doz.
Demmler Bros.	
"Cherry" Miners' Lamps, double spout	$2.00
" Drivers' " " "	2.70
" " " single "	2.50

Harp, complete, with square tin shade, per doz., $9.50.
Complete, with Burner and chimney, per doz., $1.50.
Hurricane lanterns 25 cents extra with guards.
875, ¾ wick, without guards, per doz., $5.00.
876, square safety lifting globe, per doz., $5.50.
877, ¾ wick, safety lifting globe, per doz., $6.75.
Nickel plated diamond reflector rowding lamp, 30 candle-power, $13.50 per doz.
Net
Illuminated night clock, per doz., $27.

PAPER LAMPS.
Lined with oil proof composition.

	No. 0.	No. 1.	No. 2.
Height,	2¼ in.	3 in.	3¾ in.
Diameter,	3½ in.	2¼ in.	2¼ in.
Weight,	⅓ doz.,	3¾ lbs.	1¾ lbs.
Price,	$2.75 per doz.	$2.25	2 lbs $2.75

	No. 0.	No. 3.	No. 4.
Height,	2¼ in.	5 in.	6¼ in.
Diameter,	3½ in.	3½ in.	4 in.
Weight,	⅓ doz.,	3¾ lbs.	3½ lbs.	7 lbs.
Price,	$2.75 per doz.	$3.25	$4.50

Dis., 20%.

Laundry Appliances.

Washing Machine.

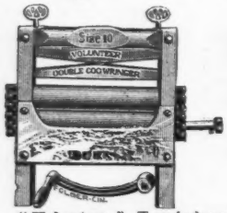
THE CATARACT.

All Metal.

Cubic Measurement 15 ft.

Price $20.

Dis., 25%.



Rolls.

"Volunteer." Length, 10 in. x 1¾ in. dia. $40 doz.

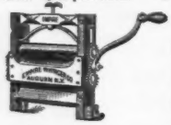
"Volunteer." Length 11 in. x 1¾ in. dia. $50 per doz.

"Volunteer." Length 12 in. x 1¾ in. dia. $60 per doz. Dis., 40%.

"Volunteer." Two independent pressure screws,

"Daisy." Length, 10 in. x 1¾ in. dia. $30 per doz.

"Daisy." Length, 12 in. x 1¾ in. dia. $18 per doz. Dis., 40%.



"Empire." Length, 10 in. x 1¾ in. dia. $63 per doz.

"Empire." Length, 11 in. x 1¾ in dia. $74 per doz.

"Empire." Length, 12 in. x 1⅞ in. dia. $84 per doz.

"Empire." Length, 12 in. x 1⅞ in. dia. $87 per doz.

"Empire." Length, 14 in. x 2¼ in. dia. $156 per doz.

"Empire." Length, 14 in. x 2¼ with pulleys. $220 per doz.

"Empire." Length, 16 in. x 2½ with pulleys. $360 per doz. Dis., 40%.

EMPIRE CLOTHES DRYING BARS. $10 per doz. Dis., 40%.

Closed.

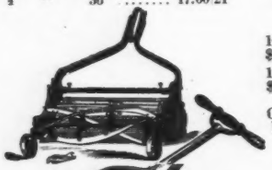
Open for use.

Lawn Mowers.

Forward Cut Mowers.

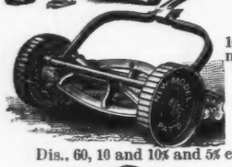
In.	Lbs.		In.	Lbs.	
0	Weight, 30¾	$13.00	16	Weight, 38	$19.00
2	" 31½	15.00	18	" 41	21.00
4	" 36	17.00	21		34.00

Dis. 60 and 5%.



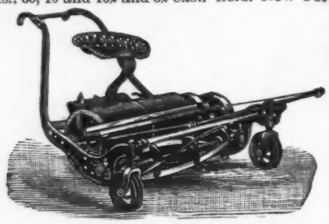
10 in.	12 in.	14 in.
$13.00	$15.00	$17.00
16 in.	18 in.	20 in.
$19.00	$21.00	$23.00

24 in., $30.00.
Geared at both ends.
Dis. 60 and 10 and 5 and 5%.



10 in. Croquet, 18 pound, mower..... $11.00
10 in..... 13.00
12 in..... 15.00
14 in..... 17.00
16 in..... 19.00
18 in..... 21.00
20 in..... 23.00

Dis., 60, 10 and 10% and 5% cash f.o.b. New York.



New Excelsior Horse Lawn Mower.

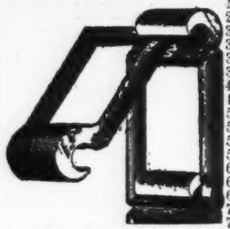
25 in. cut, without shafts or seat	$65.00
" with shaft and seat	110.00
" " " " "	135.00
" " " " "	170.00
boots, per set	12.00

Dis. 50%.

Excelsior Three-Blade Mower and Roller.
8 in., $11.00; 10 in., $13.00; 12 in., $15.00; 14 in., $17.00; 16 in., $19.00; 18 in., $21.00; 20 in., $23.00.
Dis. 60% and 5% cash 30 days f.o.b. New York.

Link Belting.

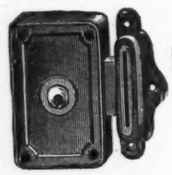
Price per running foot, net.



No.	Price.	No.	Price
25	$0.13	78	$0.40
32	.13	83	.45
33	.12	85	.50
34	.13	88	.50
35	.14	95	.60
42	.16	103	.75
45	.16	105	.70
51	.20	106	.90
52	.25	107	.80
55	.22	108	.80
57	.24	109	.90
62	.30	114	1.10
66	.30	122	1.50
67	.30	124	1.30
75	.35	146	1.40
77	.35		

Sprocket wheels..... 25%

Locks.



YALE PATENT.
RIM STORE LATCH.

	Per doz.
3 × 5 in., 4 keys	$18.00
2½ × 4 in., 3 keys	39.00

RIM NIGHT LATCH.

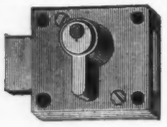
Spring lock, 3 keys	18.00
Dead lock, 3 keys	25.00

NIGHT LATCH.

Escutcheon	39.00
"	36.00

MORTISE DEAD LOCK.

4⅝ × 3½	45.00
2⅜ × 3½	24.00

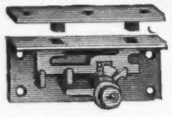


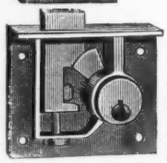
CUPBOARD LOCKS.

Plated Nose	13.20
Brass Nose	12.00

CUPBOARD

Dead Lock	10.80
Spring Lock	13.80



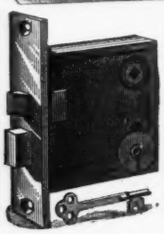


CHEST LOCKS.

Plated nose	19.20
Brass "	18.00

DRAWER LOCK.

Plated nose	10.20
Brass "	9.00



KNOB LOCKS.

5 × 3⅜	22.50
5 × 3⅜	20.00
4¼ × 3⅜	13.25
3½ × 3⅜	10.50

STANDARD LATCHES.
Dead locks.

3¾ × 2¾	24.00
2½ × 3⅜	14.00
1¾ × 2⅜	12.00

NIGHT LATCHES.

3¼ × 3⅜	20.00
2½ × 3¾	18.00

DRAWER LOCKS.
2 × 1⅝, two tumblers.

Plated nose	7.50
Brass "	6.00

Three tumblers.

Plated nose	9.00
Brass "	7.50

RIM FLUSH DRAWER LOCK.
2 in. diameter.

	2 tumblers.	3 tumblers.
Plated nose	7.50	9.00
Brass "	6.00	7.50

BRONZE SPRING PADLOCK.
2 flat steel keys.

In.	
1	11.00
1¼	12.00
1½	13.50
1¾	14.50
2	16.00
2¼	17.50

Subject to special net prices; no discount.

YALE KEYS.

Machinery—Foot Power.

Engine Lathes

8 in. swing, 20 in. bet. centers, 36 in. bed, 240 lbs. weight, $60.
8 in. swing, 30 in. bet. centers, 46 in. bed, 260 lbs. weight, $70.
8 in. swing, 36 in. bet. centers, 52 in. bed, 280 lbs. weight, $75.

Boxing for export, $2.50 extra; f.o.b. at Cincinnati, 25 % dis.

SAWS AND LATHES

Victor Scroll Saw, Cuts to 3 Inches.

24-inch swing, with 12 saw blades.... $40
Dis., 20%.

Empire Scroll Saw, Cuts to 3 Inches.

24-in. swing, drill and tilting table.
Price, boxed..... $25
Dis., 20%

The Acme Combination Saw.

Hand or steam power.
Adjustable table and gauges.

Price, boxed	$40
Scroll saw attachment	7
Boring attachment	10
Moulding attachment	10

Dis., 20%.

Paragon Self Feed Rip Saw.

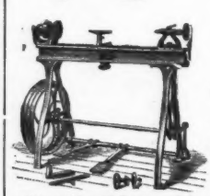
Two changes of speed; three changes of feed.
Price, with one 10 in. saw, $50.00
Dis., 20%.

Diamond Mortising Machine.

Will mortise ¼ to 1 in. wide, 3 in. deep.
" cut tenons ¼ to ¾ thick, 3 in. wide.
Price, with 3 chisels..... $25.00
Dis., 20%

The "Star" Lathe.

Swings 9 × 25 in., back geared screw cutting.
Feeds in or out, right or left. Adjustable Tail Stock for Tapers.
Price, No. 1..... $75.00
Dis., 20%.



The Crown Lathe.

Swings 8 × 24 in.

Price, boxed, No. 1	$30.00
Compound slide rest	10.00
Countershaft	10.00

Dis., 20%.

Rival Scroll Saw, with six extra saw blades, twist drill and wrench.
Price..... $10.00
Lathe attachment..... $3.00
Dis., 25%.

Rival.

The Challenge Scroll Saw, for shell, bone wood, or metal.
Nickel Plated, with six extra saws, twist drill and wrench.
Boxed..... $20.00
With lathe attachment..... $5.00
Dis., 25%.

Challenge.

Hand Circular Rip Saw.

Cuts 3¾ thick, 19 in. wide.

Price $50.00.

Dis.,

Scroll and Circular saw Combined. Combined Machines.
Combined circular scroll saw and boring attachment—2 circular saws, 12 assorted scroll saws, boring attachment, and self-centering drill chuck..... $50.00
Combined circular and scroll saw—2 circular and 12 scroll saws..... 40.00
Circular saw—1 extra rip and 1 cross-cut saw..... 35.00
Counter shaft for steam power..... 10.00
Dis., 35%.

Foot Power Former. $20.00; Knives extra, $1.00 each. Dis., 35%.

Mortising Machine. $22.00; Chisels, $1.00 each.

Dis., 35%.

Blind Slat Chisels, 3 set bits, $5.00. Dis., 20%.

Tenoning Machine, Price, $25. Dis., 35%.

Velocipede Scroll Saw,

Without boring attachment..... $20.00
With " " 23.00
1 doz. saw blades, 1 3-16 bit. } Included. Dis., 35%.

Lathe.

centres, 1 spur, 2 tool rests and sockets, 1 turned face-plate, $35.

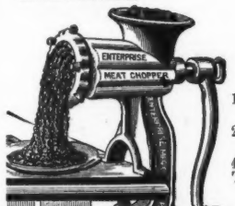
Dis., 30%.

Lathe.

One turned face-plate, two pointed and one spur center, two rests, with sockets and plate for hand tools, slide rest-wrench, belting, etc., $40.

Dis., 25%.

Meat Cutters.



5, each..... $2.00
10, " 3.00
22, " 4.00
41, " 5.00
This is a power machine.

Dis., 50%.

Enterprise.

Motors (Water).

Size No. 8, for Sewing Machines, etc , $18 each.

No. 9, ⅛ horse-power (30 lbs. pressure), ¼ h. p. (60 lbs.), ½ h. p. 100 lbs.), ¾ h. p. (150 lbs.), 1 h. p. (200 lbs.), $30.

No. 10, ¼ horse-power (30 lbs. pressure), ½ h. p. (50 lbs.), 1 h. p. (100 lbs.), 1½ h. p. (150 lbs.), 2 h. p. (200 lbs.), $50.

No. 10½, ½ horse-power (30 lbs. pressure), 1 h. p. (50 lbs), 2 h. p. (100 lbs.), 3 h. p. (150 lbs.), 4 h. p. (200 lbs.), $75.

No. 11, 1 horse-power (30 lbs. pressure), 1½ h. p. (50 lbs.), 3 h. p. (100 lbs.), 4½ h. p. (150 lbs.), 6 h. p. (200 lbs.), $100.

No. 12, 2 horse-power (30 lbs. pressure), 3 h. p. (50 lbs.), 6 h. p. (100 lbs.), 9 h. p. (150 lbs.), 12 h. p. (200 lbs.), $175.

No. 13, 3 horse-power (30 lbs. pressure), 5 h. p. (50 lbs.), 10 h. p. (100 lbs.), 15 h. p. (150 lbs.), 20 h. p. (200 lbs.), $285.

Dis., 30%.

Governors for 11 and 12, $25 extra; for No. 13, $35 extra.

Price.....	$120	$160	$200	$250	$300
MINING WHEELS	16	18	20	22	24

Power according to pressure:
3 to 50, 10 to 100, 15 to 150, 20 to 200, 30 to 300 H. P.

Concentrating Machinery.

Blake Improved Crusher: 10x7, weight 7,500; $410.00.

Blake Improved Crusher: 15x9, weight 9,000; $580.00.

Discount 25%.

Cornish Crushing Rollers: 20 diameter, 10 face, weight 5,400; $450.00.

Cornish Crushing Rollers: 20 diameter, 14 face, weight 6,000; $500.00.

Cornish Crushing Rollers: 22 diameter, 14 face, weight 9,500; $625.00.

Cornish Crushing Rollers: 27 diameter, 14 face, weight 13,000; $750.00.

Cornish Crushing Rollers: 30 diameter, 14 face, weight 15,000; $850.00.

Discount 25%.

Complete Sizing Arrangement, consisting of Revolving Screens of Steel Sheet and Hydraulic Classifier.

For Concentrator, 25 tons capacity, $250; 50 tons capacity, $350; 75 tons capacity, $450; 100 tons capacity, 800. Discount, 10 per cent.

Automatic working Jig Machines, all complete, woodword included, with slidemotion: 2 sieves, $310; 3 sieves, $360; 4 sieves, $450.

With Eccentric Motion, all complete, woodwork included: 1 sieve, $200; 2 sieves, $270; 3 sieves, $320; 4 sieves, $330.

Automatic working Double Jig Machines, all complete, woodwork included: 4 sieves, $210; 6 sieves, $335; 8 sieves, $425. Discount, 25 per cent.

Single Rittinger Percussion Tables, all the iron parts, $350; Double Rittinger Percussion Tables, all the iron parts, $500. Discount, 10 per cent.

Improved Rotary Tables, all the iron parts and pipes, $200. Discount, 25 per cent.

Nails and Tacks.

Swedes.

Per doz.	½	¾	1	1½	2	2½	3		
½ wt..	35	40	46	50	55	60	65	75	
6	8	10	12	14	16	18	20	24	oz.
85	1.00	1.20	1.40	1.60	1.75	1.85	2.15	2.55	
Doz.full	½	¾	1	1½	2	2½	3	4	
weight	60	70	80	90	1.00	1.10	1.20	1.40	
6	8	10	12	14	16	18	20	24	oz.
1.60	1.90	2.30	2.70	3.10	3.40	3.80	4.20	5.00	
lb., bulk	½	¾	1	1½	2	2½	3	4	
or paper	1.60	1.25	1.00	80	66	58	52	46	
6	8	10	12	14	16	18	20	24	
36	32	31	30	29	28	28	28	28	

Discount, 67½, 10 and 2%.

O. H. Swedes.

Price, same as Swedes.
Swedes steel tacks same list price as iron.

Upholsterers.

Discounts, 72½, 10 and 2%.

Price, same as Swedes.

Cut Tacks. Price per dozen ounces.

	1	1½	2	2½	3	4	6	8	10
¼ wt.....	..	..	..	....	35	40	45	50	55
	12	14	16	18	20				
	60	70	80	90	1.00				
⅛ wt.	1	1½	2	2½	3	4	6	8	10
	45	50	50	55	60	65	70	80	95
	12	14	16	18	20				
	1.10	1.25	1.40	1.55	1.70				
Full wt...	1	1½	2	2½	3	4	6	8	
	80	90	90	1.00	1.10	1.20	1.30	1.50	
	10	12	14	16	18	20			
	1.80	2.10	2.40	2.70	3.00	3.30			

Discount, 70, 10 and 2%.

Carpet Tacks, flat and oval heads.

Blued, doz.	oz.	4	6	8	10	12	14	16	18	20
¼ wt.		35	40	45	50	55	65	75	85	95
		22	24							
		1.05	1.15							
" ⅛ wt.		4	6	8	10	12	14	16		
		65	70	80	95	1.10	1.25	1.40		
		18	20	22	24					
		1.55	1.70	1.85	2.00					
Tinned, doz. ¼ wt.		4	6	8	10	12	14	16		
		50	55	60	75	85	1.00	1.10		
		18	20	22	24					
		1.20	1.35	1.45	1.60					
Tinned, doz. ⅛ wt.		4	6	8	10	12	14			
		95	1.05	1.15	1.40	1.60	1.85			
		16	18	20	22	24				
		2.10	2.35	2.60	2.85	3.10				

Discount, 72½, 10 and 2%.

Finishing Nails.

Inch....	⅝	3½-8	4-8	4½-8	⅝	5½-8	6-8	7-8	1
Per lb...	48	40	32	28	26	24	22	20	18

1⅛ and larger.
16

Discount, 60, 10 and 2%.

Chair Nails.

Doz. ⅛ wt. ; doz. full wt.; pound B. or P.

Inch..	⅝	3½-8	4-8	4½-8	⅝	5½-8	6-8	7-8
Per lb.	51	43	35	31	29	27	25	23
	1	1⅛						
	21	19						

Discount, 60, 10 and 2%.

Common and patent brads.

inch.	Price per doz. ⅛ wt.	Price per doz. full wt.	Price per lb. in papers or bulk.
2-8.....	.50	1.00	1.25
3-8.....	.60	1.20	.80
4-8.....	.65	1.30	.58
5-8.....	.72	1.44	.48
6-8.....	.80	1.60	.36
7-8.....	.90	1.80	.30
1.....	1.00	2.00	.26
1⅛.....	1.12	2.24	.25
1¼.....	1.26	2.52	.24
1½.....	1.82	3.64	.22
1¾.....	2.25	4.50	.20
2.....	2.43	4.86	.18

Dis. 60, 10 and 2%.

Oils.

LUBRICATING.

Lubroleine A cylinder oil 50 in. barrels.
Lubroleine D cylinder oil 40 in. barrels.
Lubroleine A machine oil 45 in. barrels.
Lubroleine B machine oil 35 in. barrels.
Lubroleine A engine oil 50 in. barrels.
Lubroleine B engine oil 40 in. barrels.
In cases 5c gal. extra.
Crescent Axle Grease.—Barrels, 3c per lb; 100-lb. kegs, 3½c lb.; 2-lb. decorated tins, $12, gross less 5 per cent.
Texas Star Axle Grease.—Barrels, 2½c per lb.; 100 lb. kegs, 3c per lb.
See Axle Grease, page 2.

Packing.

Eureka, 75c. per lb. Dis., 40%.
Soapstone—Standard, 8c. per lb.
XX. 11c. per lb.
Crown—No. 1, 23c. per lb.
No. 2, 26c. per lb.
Climax, 9c. per lb. Net.

SELDEN'S PATENT.

For Steam, Air, Water and Ammonia.
With Rubber Core, 60 cents per lb.
Dis., 25 and 5%.
With canvas core, 50 cents per lb.
Dis., 30 and 5%.

Paper, Waxed.

White.	Per ream.
XX, 24 × 36.....	$2.20
"Sparks' A No. 1 Brand," 24 × 36.....	2.10
"Progress No. 2," 24 × 36.....	1.80
"Climax," 24 × 36.....	1.60
24½ × 36.....	1.36
FF, or B. F., 24 × 36.....	4.90
Colored.	
A, 24 × 36.....	2.40
B. 24 × 36.....	2.00
Manilla.	
A, 24 × 36.....	1.88
"Climax," 24 × 36.....	1.40

Discount, 5%.

No.	Manilla. Flat bags. Per M.	Sq. bags. Per M.	No.	White. Flat bags. Per M.	Sq. bags. Per M.
¼	$1.25	$1.40	¼	$1.70	$1.90
⅛	1.50	1.75	⅛	2.05	2.25
1	1.85	1.85	1	2.60	2.85
1½	2.00	2.30	1½	2.80	3.15
2	2.25	2.60	2	3.12	3.45
3	2.70	3.10	3	3.70	4.10

No.	Mikado. Per M.	No.	Mikado. Per M.
¼	$1.40	1½	$2.30
⅛	1.75	2	2.60
1	1.85	3	3.10

Discount, 10%

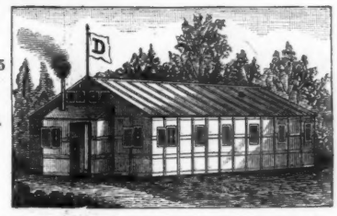
Portable Houses.

Weight, 450 lbs.

Price, $150.

Closes securely.

Dis., 10%.



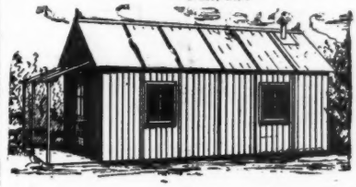
Weight, 85 lbs. per section.

Price, $220.

Dis., 10%.

No. 10.—26 × 33 ft., including veranda and rear extension. Main part, 19 × 26 ft..... $500.00

Dis., 10%.



F. o. b. Cars Chicago or New York

Size.	Doors.	Windows.	No. porch.	End porch	Side porch.
7 × 9	1	2	$64.00	$71.00	$73.00
7 × 12	1	2	75.00	82.00	87.00
7 × 16	1	2	90.00	97.00	106.00
7 × 19	2	4	117 00	124.00	136.00
10 × 9	1	2	70.00	80.00	79.00
10 × 12	1	2	92.00	102.00	104.00
10 × 16	1	4	108.00	118.00	124.00
10 × 19	2	4	134.00	144.00	153.00
10 × 26	2	4	172.00	182.00	198.00
10 × 32	2	6	203.00	213.00	235.00
12 × 12	1	2	102.00	114.00	114.00
12 × 16	2	4	138.00	150.00	154.00
12 × 19	2	4	160.00	172.00	179.00
12 × 26	2	4	193.00	205.00	219.30
12 × 32	2	6	245.00	257.00	277.00

Post Hole Diggers.

Little Giant.....	$36.00	doz 11 cu.ft.
Hercules.....	30.00	" " "
New Champion....	20.00	" " " "
Scheidler.....	36.00	" " "

Dis. 40% f.o.b. New York or Boston.

Presses.

41, 42, 43, 44, 45.

Combined press for cutting, forming, horning and seaming.

Particulars of flat front presses, including beds, slides, bolsters, plates, etc.

Prices are net, delivered on steamers in New York, including insurance, etc.

Nominal size of press.....	41	42	43	44	450
Price, including et ceteras.....	$140	$220	$300	$420	$700
Weight, about.....lbs	600	1050	1900	3600	7200
Greatest diameter that can be wired.....ins	5	7	10	14	20
Greatest depth that can be wired.....ins	8	10	13	16½	20
Hole through bed—circle intersecting.....ins	4½	6	8½	12	17
Hole through back—width.....ins	8	9½	12	15½	20½
Width between die clamps—clear.....ins	8	11	15	20	27
Distance back from center of slide bar.....ins	4½	5½	7	9	12
Height to slide-bar, when up..ins	5¼	6½	7½	8½	9
Stroke of slide-bar.....ins	1	1¼	1½	1¾	*
Adjustment of slide-bar.....ins	1	1¼	1½	1¾	
Diameter of fly-wheel.....ins	20	26	32	38	44
Width of fly-wheel.....ins	3	4	5	6	7
Weight of fly-wheel, about....lbs	125	250	420	725	1100
Speed per minute, about.....rev	120	110	100	90	80
Cubic feet boxed, about.....	30	40	50	60	70

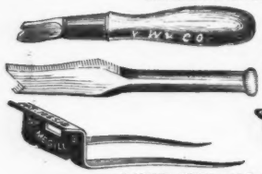
Printers' Sundries.

Wood rules, 12 cents per yard.
Wood rules, on end wood, 15 cents per foot.

EUREKA STAND.
12 full cases.

Price without cases.....$12.00
Boxing and cartage..... 1.25

SHOOTING STICKS.



Each.
No. 1, 75c.
No. 2, $1.
No. 4, 45c., black.
No. 4, 60c., bright.
No. 5, 60c., black.
No. 5, 75c., bright.

GAUGE PINS—ALL SIZES.

Brass, 40c. doz. | Steel, 60c. doz.
Wire, 25c. doz. | Golden, 40c. doz.

MITRE BOXES.

Regular size, 2 in., 50c. each.
Extra size, 3½ in., 75c. each.

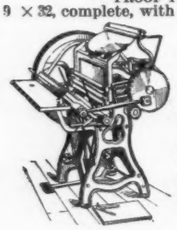
LEAD CUTTER.

Curtis' Lead Cutter.....$2.00

PROOF PRESS, "OUR OWN."

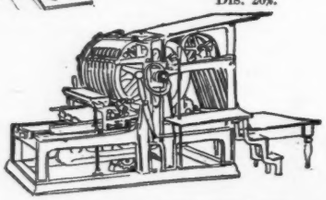
9 × 32, complete, with Brayer.....$28.00

THE GLOBE PRESS.



8 x 12 in. inside clear, with throw-off.....$150.00
9 x 13 in. inside clear, with throw-off..... 175.00
10 x 15 in. inside clear, with throw-off..... 200.00
11 x 17 in. inside clear, with throw-off..... 250.00
Steam fixtures..... 15.00
Fountain..... 12.50

Dis. 20%.

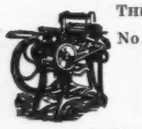


THE "LIBERTY" CYLINDER PRESS.
For Newspaper and Job Printing.

	Bed.	Form.	
No. 5—	29 × 42	24 × 40	$1,200
6—	33 × 47	28½ × 45	1,300
7—	37 × 51	33 × 49	1,600

Dis., 20 and 5%.

THE "LIBERTY" JOB PRINTING PRESS.



Size of chase.

No. 2 — 7	× 11	$200
2a— 9	× 13	250
3 —10	× 15	300
3a—11	× 17	350
4 —13	× 19	400
5 —14½	× 22	500

Dis., 12% and 5%.

Two sizes built extra strong for boxmakers, embossing, etc.

No. 3a—11 × 17.....$375
4 —13 × 19..... 425

Dis., 12 and 5%.

Fountains, either size, $25 extra, if ordered with press.
Steam fixtures, either size. $15 extra.

THE AMERICAN CARD AND BILL HEAD PRESS.

No. 5—4 × 6..... $10
7—6 × 9..... 30
8—8 × 12..... 60

Dis., 20% and 5%.

THE "LIBERTY" PAPER CUTTER.

Cuts 30 inches.....$140.00
Extra knife..... 18.80

Dis., 12% and 5%.

THE "LIBERTY" IMPOSING TABLES

Marble top.

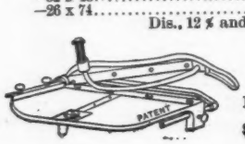
No. 1—24 × 36.....$24
2—32 × 48..... 38
3—26 × 74..... 44
4—36 × 48..... 48

Dis., 12% and 5%.

Slate Top.

No. 1—24 x 36.....$18
—32 x 48..... 25
—26 x 74..... 32

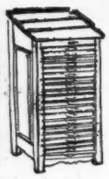
Dis., 12 % and 5%.



Kelsey & Co.,

The Eagle card and Paper Cutter, 24½ inch, $12 each, $100 per doz.

TYPE CABINETS.



Number of cases.	Stained. Flat.	Stained. Galley.*	Grained. Flat.	Grained. Galley.*
	$	$	$	$
12⅝	12.00	14.50	14.00	17.00
16⅔	15.00	17.50	17.00	20.00
18¾	16.50	19.00	18.50	21.50
20⅞	18.00	20.50	20.00	23.00
12¼	15.00	17.50	17.00	20.00
16¾	18.00	20.50	20.00	23.00
18¾	19.50	22.00	21.50	24.50
20¾	22.00	24.50	23.00	26.00
12 full	18.00	20.50	20.00	23.00
16 "	22.00	24.50	24.00	27.00
18 "	24.00	26.50	26.00	29.00
20 "	26.00	28.50	28.00	31.00

Number of cases.	Pine. Flat.	Pine. Galley.*	Cherry. Flat.	Cherry. Galley.*	Napanoch. Flat.	Napanoch. Galley.*	Walnut. Flat.	Walnut. Galley.*
	$	$	$	$	$	$	$	$
12⅝	18.00	21.00	20.00	23.00	22.00	25.00	23.00	26.00
16⅔	22.00	25.00	24.00	27.00	26.00	29.00	27.00	30.00
18¾	24.00	27.00	.....	.....	.....	.....	.....	.....
20⅞	26.00	29.00	28.00	31.00	30.00	33.00	31.00	34.00
12¼	21.00	24.00	23.00	26.00	25.00	28.00	26.00	29.00
16¾	25.00	28.00	27.00	30.00	29.00	32.00	30.00	33.00
18¾	27.00	30.00	.....	.....	.....	.....	.....	.....
20¾	29.00	32.00	31.00	34.00	33.00	36.00	34.00	37.00
12 full	24.00	27.00	26.00	29.00	28.00	31.00	29.00	32.00
16 "	28.00	31.00	30.00	33.00	32.00	35.00	33.00	36.00
18 "	30.00	33.00	.....	.....	.....	.....	.....	.....
20 "	32.00	35.00	34.00	37.00	36.00	39.00	37.00	40.00

—*Furnished with galley top and extra drawer for copy. Dis., 20 and 5%.

CASE STANDS AND RACKS.

Stands.
Single, without racks.....$3.75
" with racks for 8 full cases..... 4.00
Single, with racks for 10 full cases..... 4.2
Single, with racks for 12 full cases..... 4.50
Single, with racks for 14 full cases..... 4.75
Double, without racks..... 4.25
" with racks for 8 full cases..... 4.50
Double, with racks for 16 full cases, and gal. rest 6.25
Double, with racks for 20 full cases and gal. rest.... 6.50
" " " " 24 " " " " " 6.75
" " " " 24 ⅝ cases 5.25
" " " " 8 full and 8 ⅔ cases 5.00
" " " " 8 " " 8 ¾ " 5.25
" " " " 10 " " 12 ⅔ " 5.55
" " " " 12 " " 16 ⅝ " 5.70
" " " " 12 " " 16 ¾ " 6.05
Stands with closed ends, extra..... 2.00
Extra slides for stands, each..... .05

GALLEY RACKS.
From $3 up.

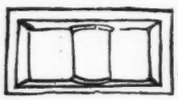
LEAD CUTTERS,
From $2 up.
D and 5%.

THE "LIBERTY" TYPE CASES.

Name.	Outside Measurements.
Full size	32¼x16½x1 9-16
Rooker size	28½x14¼x1 9-16
¾ size	26x16½x1⅝
⅔ size	22⅝x16½x1⅝
Enlarged size	32¼x23x2 3-16
Wood type "	32¼x23x1 9-16
Mammoth "	44x23x1 9-16

Cabinet case sides extend 1½ to 3 inches. In ordering cabinet cases, state whether high or low fonts are wanted. 30 and 5%.

THE "LIBERTY" STEEL SHOOTING STICKS.
Bright, $1 each.
Nickelplated, $1.25 each.
Dis., 40%.



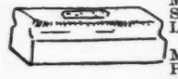
STANDARD METAL FURNITURE
25c. a pound.
In fonts of 25, 50, 75 and 100 lbs.
Dis., 15%.

THE "LIBERTY" MALLETS.

Hickory, small.....$ .20
" medium..... .25
" large..... .30
" iron bound..... 1.00
Lignum Vitæ, No. 4..... .30
" " No. 3..... .40
" " No. 2..... .50
" " No. 1..... .70

Dis. 20 and 5%.

THE "LIBERTY" PLANERS AND PROOF PLANERS.



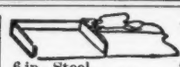
Midget planer..... 10c.
Small Maple..... 20c.
Large " ..... 25c.
" b'ked with leather..... 30c.
Midget " " ..... 12c.
Proof planer, faced with cloth, 50c.
Dis., 40%.

COMPOSING STICKS.

GROVER S PATENT AND UNION.

	Screw or News.
6 in.	$ .90
8 "	1.10
10 "	1.20
12 "	1.40
14 "	1.60
16 "	1.80
18 "	2.00
20 "	2.20
	2.40

Composing rules, 14 ems pica and under, 25 cents.



THE "LIBERTY" COMPOSING STICKS.

Grover.

6 in., Steel	$ .90	16 in., Steel	$1.80
8 "	1.00	18 "	2.00
10 "	1.20	20 "	2.20
12 "	1.40	Extra Clasp	.10
14 "	1.60	Extra Knee	.40

Screw.

6 in., Steel	$ .75	16 in., Steel	$1.45
8 "	.80	18 "	1.60
10 "	1.00	20 "	1.75
12 "	1.15	Extra Knee	.30
14 "	1.30	" Screw and Nut.	.10

Dis., 40%.

Yankee.

6-in., Steel	$ .75	12 in., Steel	$1.15
8 "	.80	Extra Knee	.30
10 "	1.00	" Clamp and Screw	.15

Other Sizes to Order.
Dis., 40%.

Albion.

6-in., Steel	$1.00	6-in, German Silver	$1.50
8 "	1.10	8 " " "	1.75
Extra Knee	.40	Extra Screw and Nut.	.10

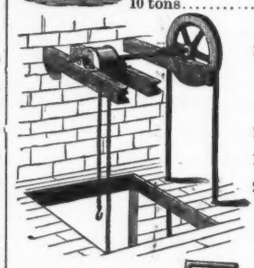
Pulley Blocks.

WESTON DIRECT.

	Each.
⅛ ton	$10
¼ ton	13
½ ton	15
1 ton	20
1½ tons	25
2 tons	30
3 tons	40

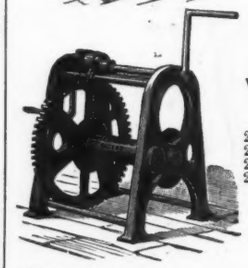
Geared.

1 ton	45
2 tons	35
3 tons	60
4 tons	80
5 tons	110
6 tons	150
8 tons	210
10 tons	250



DOUBLE LIFT HOISTS FOR HATCHWAYS, ETC.

500 lbs	$25.00
1000 "	50.00
1500 "	65.00
2000 "	80.00
500 "	30.00



WESTON CRAB SAFETY BRAKE, HANDLES CANNOT FLY BACK.

	Each.
21	$35.00
22	45.00
23	65.00
25	100.00

Pumps.

Prices on all pumps include cylinders.

No.	Dia. Cyl.	Suction.	Cap. stroke.	Price Iron.	Price Brass cyl.
0	2 in.	1 in.	1-15 gal.	$3.50	.....
1	2¼ "	1 "	1-12 "	4.00	$6.00
2	2⅝ "	1¼ "	1-11 "	4.50	7.00
3	2½ "	1¼ "	1-10 "	5.00	8.00
4	3 "	1¼ "	1-6 "	5.50	10.00
5	3¼ "	2 "	1-5 "	6.50	14.00
6	3½ "	2 "	1-4 "	8.00	18.00
7	4 "	2½ "	1-3 "	12.00	20.00

Dis., 65%.

1	2½ in.	1¼ in.	1-10 gal.	4.25	.....
2	3 "	1¼ "	1-7 "	4.75	.....
3	3½ "	1¼ "	1-5 "	5.25	.....
4	4 "	1½ "	1-4 "	5.75	.....
5	4½ "	1½ "	1-3 "	6.25	.....

Dis., 70%.

Standard and Cylinder for 1½ in. Iron Pipe $16.00. Dis., 55%

No. 6½, standard and cylinder, 1¼ in pipe, $13.00.
No. 7½, standard and cylinder, 1¼ in. pipe, $15.00.
No. 8½, standard and cylinder, 1½ in. pipe, $18.00.
With hose and discharge pipe, add $3.00 to list price.
Dis., 55%.

No. 1, diam. cyl., 2½ in.; cap. stroke 1-8 gal.; size pipe, 1¼ in. Price, iron, $12.50; brass cyl., $17.50.
No. 2, diam. cyl., 3 in.; cap. stroke, 1-6 gal.; size pipe, 1¼ or 1½ in. Price, iron, $14.50; brass cyl., $18.50.
No. 3, diam. cyl., 4 in.; cap. stroke, 2-5, gal.; size pipe, 1½ or 2 in. Price, iron, $23.50; brass cyl. $34.50. Dis., 55%.

No. 1, diam. cyl., 3 in.; suction, 1¼ cap. stroke, 3-10 gal. Price, iron, $28.00; brass cyl., $58.00.
No. 2, diam. cyl., 4 in.; suction, 1½ in.; cap. stroke, 1-2, gal. Price, iron, $32.00; brass cyl., $60.00.
No. 3, diam. cyl., 5 in.; suction, 2 in.; cap stroke, 6-7 gal. Price, iron, $35.00: brass cyl., $90.00.
No. 4, diam. cyl., 6 in.; suction, ½ in

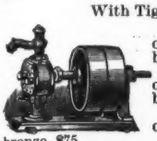
cap. stroke, 1 1-5 gal. Price, iron, $45.00; brass cyl. $120.00.
Dis., 45%.

No.	Diam. cyl.	Cap. stroke.	Stroke.	Pipe.	Price.
0	2 in.	1-11 gal.	7 in.	1 in.	$21.50
00	2½ "	1-7 "	7 "	1 "	23.00
1	3 "	1-5 "	7 "	1½ "	25.25
2	3½ "	1-3 "	7 "	1½ "	27.25
3	4 "	4-10 "	7 "	2 "	30.50
3½	4½ "	1-2 "	7 "	2 "	37.50
4	5 "	8-10 "	10 "	2½ "	44.00
4½	5½ "	1 "	10 "	2½ "	47.00
5	6 "	1 1-5 "	10 "	3 "	50.00

Dis., 40%.

No.	Diam. cyl.	Cap. stroke.	Diam. pipe.	Price. Iron.	Br's cyl.
1	2 in	1-5 gal.	1 in.	$39	$51
2	2½ "	1-3 "	1¼ "	41	56
3	3 "	1-2 "	1½ "	45	62
4	3½ "	6-7 "	2 "	51	81
5	4 "	7-8 "	2 "	63	114
6	4½ "	1 "	2 "	80	155

Dis., 40%.
With Tight and Loose Pulleys.



No. 1, cap. per rev., 1-6 gal.; size of pipe, 1¼ in.; price, iron, $26; bronze, $45.
No. 2, cap. per rev., 1-5 gal.; size of pipe, 1½ in.; price, iron, $31; bronze, $55.
No. 4, cap. per rev., 1-3 gal.; size of pipe, 2 in.; price, iron, $48; bronze, $75.
Pulleys on Nos. 1 and 2 are 8 in. diam., 2½ in. face; on No. 4, 12 in. diam., 3½ in face.
Balance wheels for above pumps. $1, $2, and $3, according to size. Dis., 45%.

No. 2, ½ to 2 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive, ¾ in.; discharge, ⅜ in.; price, $9.
No. 3, 1 to 4 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive, 1 in.; discharge, ½ in.; price, $11.
No. 4, 2 to 8 gal. per min.; length of drive pipe, 25 to 40 ft.; calibre of pipes, drive 1¼ in; discharge ½ in; price $14
No. 5, 3 to 14 gal. per min.; length of drive pipe, 25 to 40 ft.; calabre of pipes, drive 2 in; discharge 1 in; price $22.
No. 6, 4 to 25 gal. per min.; length of drive pipe, 30 to 40 ft.; calibre of pipes, drive, 2½ in.; discharge, 1¼ in.; price, $40.
No. 7, 8 to 60 gals. per min.; length of drive pipe, 30 to 40 ft.; calibre of pipes, drive, 4 in.; discharge, 2 in.; price, $75.
No. 8, 12 to 120 gal. per min.; length of drive pipe, 30 to 50 ft.; calibre of pipes, drive, 6 in.; discoarge, 2½ in.; price, $125. Dis., 45%.

Railroad Dumping Cars and Carts.

Cars.	Gauge.	Cap.	Net	Cap.	Net	Cap.	Net
Side Dumping	24"	1 c. y.	$55	2 c. y.	$65	3 c. y.	$75*
End "	"	"	55	"	65	"	75*
Revolving "	"	"	70	"	80	"	90*
Bottom "	"	"	80	"	90	"	100*
Tunnel	"	"	55	"	65	"	75*
Mine	"	"	50	"	60	"	70*
Plantation	30"		43				
Logging	36"		170				
"	4' 8½"		185				
Hand	36"		45				
"	4' 8½"		50				
Push	36"		40				
"	4' 8½"		45				
R.R. Construction	36"		60				
"	4' 8½"		65				
Carts.							
Plantation and Railroad			45 to 75				
Wagons.							
McEwen Patent Dumping		1 "	175	1½ "	200		

*These cars built of any gauge from 18" to 56½" and of any capacity from ½ to 6 cu. yd.

Refrigerators.
Indurated Fibre and Stoneware-Lined.

No.	High.	Wide.	Deep.	Price.
35	46¼	28¾	20½	$20.00
75	44¼	33¾	23½	28.00
85	47¾	38	23½	34.00

Nos. 75, 85.

No. 2. No. 6.

No.	High	Wide.	Deep.	Price.
2	41	46	26	$36.00
6	84	46	26	60.00

Mirror 16 by 18 in. Dis., 40 and 2½%.

Rat Traps.

1 doz. in box.
1 gross in case.
$30 per gross.
Dis. 50 and 10%.

Roofing.

CORRUGATED IRON.
2½ inch corrugations.

Gauge.	Per square.
No. 18, painted red	$9.10
No. 20, " "	7.60
No. 22, " "	6.50
No. 24, " "	5.35
No. 26, " "	4.65
No. 27, " "	4.35
No. 28, " "	4.00
No. 18, galvanized	13.30
No. 20, "	10.60
No. 22, "	9.10
No. 24, "	7.45
No. 26, galvanized	7.05
No. 27, "	6.95
No. 28, "	6.75

Dis., 10%. F. o. b. N. Y.

Sash Chains.

No. A. "Giant" metal, 15c. ft., wts. not over 125 lbs.
No. 1. "Giant" metal, 12c. pr. ft., wts. not over 75 lbs.
No. 2. "Giant" metal, 10c. pr. ft., wts. not over 40 lbs.
No. 0. "Giant" metal, 8c. pr. ft., wts. not over 25 lbs.
No. 1. Red metal, 10c. pr. ft., wts. not over 40 lbs.
No. 2. Red metal, 8c. pr. ft., wts. not over 30 lbs.
No. 0. Red metal, 6c. pr. ft. wts. not over 15 lbs.
No. 1. Steel, 8c. pr. ft., wts. not 75 lbs.
No. 2. Steel, 6c. pr. ft., wts. not over 30 lbs.
No. 0. Steel, 4c. pr. ft., wts. not over 15 lbs.
No. 1. Steel, black enameled, 9c. pr. ft., wts. not over 75 lbs.
No. 2. Steel, black enameled, 7c. pr. ft., wts. not over 30 lbs.
No. 0. Steel, black enameled, 5c. pr. ft., wts. not over 15 lbs.
Fastenings for hanging a window of 2 sashes for Nos. 1 and 2 chains, consisting of 4 hooks, 4 rings, 4 sash irons, a set, 18c. per set.
Fastenings for hanging a window of 2 sashes for No. 0 chains, 14c. per set.

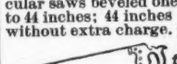
Dis. on				
"Giant" metal chain	40	10	10	10%
" Red metal chain	40	10	10	10%
" Steel " "	40	10	10	10%
" Fastenings	40	10	10	10%

Saws.

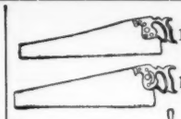
PATENT GROUND AND TEMPERED SOLID TOOTH CIRCULAR SAWS.

Diameter. Inch.	Thickness. Gauge.	Size of hole. Inch.	Price each.	Extra for each additional gauge, heavier.	Prices for beveling new saws (grinding old saws, extra). Per gauge.
1	24	⅝	$0.50	$0.01	$0.06
2	23	⅝	.60	.01½	.08
3	21	½	.70	.02½	.10
4	19	¾	.90	.03	.14
6	18	¾	1.30	.05	.18
8	18	⅞	1.75	.08	.22
10	16	1	2.30	.12	.28
12	15	1	3.00	.17	.35
16	14	1⅛	5.50	.25	.50
20	13	1 5-16	8.50	.35	.70
24	11	1⅜	12.00	.55	.90
28	10	1½	16.00	.80	1.20
32	10	1⅝	20.00	1.00	1.40
36	9	1⅝	25.50	1.40	1.70
40	9	2	35.00	2.00	2.00
44	8	2	52.50	3.00	2.40
48	8	2	70.00	4.00	2.80
52	7	2	90.00	5.00	3.25
56	7	2	115.00	7.00	3.75
60	6	2	145.00	9.00	4 25
64	6	2	180.00	12.00	5.00
68	5	2	225.00	18.00	5.75
72	5	2	290.00	24.00	6.55
76	5	2	375.00	30.00	7.50

Circular saws to cut metal or ivory, 50% advance. No extra charge for saws one gauge thicker than list. Circular saws beveled one gauge without extra charge up to 44 inches; 44 inches and larger, beveled two gauges without extra charge. Dis., 45%.

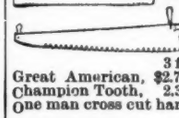


Hand--London Spring Steel; four brass screws.
26 in. $30.00 per doz. Dis., 20%.



Hand--Skew Back Saw, Apple Handle; 5 screw.
26 in. $22.00 per doz.

Hand--Grained Blade, Beech handle, polished edge; 4 screws.
26 in. $20.00 per doz.
Dis., 20%.



One man Cross-Cut--Supplementary Handle.

	3 ft.	3½ ft.	4 ft.	4½ ft.	5 ft.	5½ ft.	6 ft.
Great American,	$2.75	$3.00	$3.50	$4.00	$4.50	$5.00	$5.50
Champion Tooth,	2.35	2.60	3.15	3.50	3.85	4.25	4.65

One man cross cut handles, $4.50 per doz. Dis., 45%.

Saw Set.

Adjustable ball and socket saw clamp,
Japanned, $14 per doz.

Scales.—Discount on scales, 50, 10 and 5 per cent.

Postal scales.
No 1, capacity ½ to 9 oz. $3.00.
No. 2, capacity ½ to 12 oz. $4.00.
No. 3, capacity ½ to 34 oz. $6.00
No. 4, capacity ½ oz. to lbs., $8.00

Butter Trip Scales, slab, weights and scoop.

No. 7, ½ oz. to 10 lbs., 10 in. slab,	without side beam		$10.50
" " " " " " "	with "		11.50
" 8 " " 20 lbs., 12 in. "	without "		12.50
" " " " " " "	with "		13.50

Tea Scales—All Seamless Scoops.

Capacity.	Scoop.	Capacity.	Scoop.
¼ oz. to 10 lbs.	Tin ..$8.00	¼ oz. to 10 lbs.	Brass .. 9.06

Druggists.

Capacity.	Scoop.	Capacity.	Scoop.
1-16 oz. to 8 lbs.	Tin ..$10.00	1-16 oz. to 8 lbs.	Brass..$11.00

Even balance trip scales, seamless scoop, with weights.

No. 1, capacity ½ oz. to 2 lbs., tin scoop, $5.50 brass scoop, $6.50.
No. 2, capacity ½ oz. to 4 lbs., tin scoop, $6.50; brass scoop, $7.50.
No. 2½, capacity ½ oz. to 18 lbs , tin scoop, $11; brass scoop, $12.50.

Counter.

Capacity.	Scoop.	Capacity.	Scoop.
½ oz. to 36 lbs.	Tin ..$10.00	½ oz. to 36 lbs.	Brass..$12.00

Grocer.

Capacity.	Scoop.	Capacity.	Scoop.
½ oz. to 62 lbs.	Tin... $12.00	½ oz. to 62 lbs.	Brass..$14.00

Meat or Butter Scales, with Slab.

½ oz. to 62 lbs.,	with Single Beam	$14.00
" " " "	Double "	15.00

Patent Boston platform, 13½ in. long by 10 in. wide.
Pillar, 18 in. high, double beam, marked both sides.
With large seamless tin scoop, $25.00
" " " brass " 27.00

Platform scales. Without Wheels.

No.	Capacity.	Platform.	Price.
	400 lbs.	21½ by 15 inches.	$23.00
	600 lbs.	25 by 16 "	30.00
	800 lbs.	25 by 17 "	34.00
	1,000 lbs.	26 by 17 "	39.00
	1,200 lbs.	28 by 20 "	45.00
	1,600 lbs.	29 by 21 "	55.00
	2,000 lbs.	32 by 23 "	70.00

With Wheels.

No.	Capacity.	Platform.	Price.
1	400 lbs.	21½ by 15 inches.	$26.00
2	600 lbs.	25 by 16 "	33.00
3	800 lbs.	25 by 17 "	38.00
4	1,000 lbs.	26 by 17 "	43.00
5	1,200 lbs.	28 by 20 "	49.00
6	1,600 lbs.	29 by 21 "	60.00
7	2,000 lbs.	32 by 23 "	75.00

Brass sliding poise at same price if so specified in order

No.	With Wheels and Drop Lever. Capacity.		Platform.	Price.
	1,000 lbs.	26	by 17 inches.	$51.00
5	1,200 lbs.	28	by 20 "	59.00
6	1,600 lbs,	29	by 21 "	70.00
7	2,000 lbs.	32	by 23 "	82.00
8	2,500 lbs.	33¼	by 24¾ "	94.00
9	3,000 lbs.	38	by 30 "	125.00

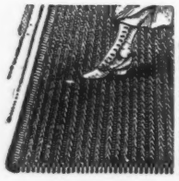
Shears. The Patent "Eureka

No. 1 cuts round metal up to ¼ in. steel to ⅛, $12.

No. 2 cuts round metal up to ⅛ in., steel to 3-16, $20.

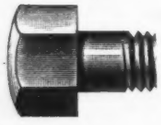
Discount, 25%.

Steel Wire Mats.



	Galvanized Steel Wire.		(Style A) "Hartman Flexible."
No. 2.	Size 16x24.	Each	$1.50
No. 3.	" 18x30.	"	2.00
No. 4.	" 22x36.	"	3.00
No. 5.	" 26x48.	"	4.50
No. 6.	" 30x48.	"	5.25
No. 7.	" 36x48.	"	6.50
No. 8.	" 36x60.	"	8.00
No. 9.	" 36x72.	"	10.00

Brass mats "list" double the price of galvanized Style A) for similar sizes.
3 doz. lots, dis. 33⅓%.
6 doz. lots, dis. 40%.
12 doz. lots. dis. 40 and 5%.



Screws.

STEEL SCREWS ADD 50% TO LIST.
Prices are per 100.
Hexagon Cap Screws.
Heads on Steam-tight Screws not polished, unless so ordered. Can make these 12 inches long.

Diam. head.	7-16	½	9-16	⅝	¾	13-16	⅞	1	1⅛	1¼	1⅜
Length head.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛
Diam. screw.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞		1⅛
¾	3.00	3.25	3.75	4.40	5.50	7.00					
1	3.25	3.50	4.00	4.70	5.70	7.00	9.50				
1¼	3.50	3.75	4.25	5.00	6.00	7.50	9.50	12.20			
1½	3.75	4.00	4.50	5.30	6.30	8.00	10.00	12.20	16.00		
1¾	4.00	4.25	4.75	5.60	6.60	8.50	10.60	12.80	16.60	21.20	
2	4.25	4.60	5.05	5.95	7.00	9.10	11.20	13.40	17.20	22.30	29.00
2¼		5.00	5.40	6.35	7.50	9.70	11.90	14.10	17.90	23.60	30.50
2½			5.80	6.80	8.00	10.40	12.70	14.90	18.80	25.10	32.30
2¾				7.30	8.60	11.20	13.60	15.90	20.00	26.90	34.40
3					9.30	12.10	14.70	17.00	21.80	29.00	37.00
Thread to in.	20	18	16	14	12	12	11	10	9	8	7
Add for each ¼ in.	30	40	50	60	80	1.00	1.30	1.60	2.00	2.40	3.00

Dis., heads ground, 60 and 10%; dis., heads black, 60, 10 and 5%; dis., heads extra finish, 50 and 10%; dis., heads case-hardened, 55% and 10 dis.; dis., heads polished after hardening, 45 and 10%.

SQUARE CAP SCREWS.

Diam. head.	3/8	7-16	½	9-16	⅝	11/16	¾	⅞	1⅛	1¼	1⅜
Length head.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛
Diam screw.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1⅛
¾	2.40	2.75	3.20	3.80	4.40	5.75					
1	2.60	2.95	3.40	4.00	4.70	5.75	7.70				
1¼	2.75	3.10	3.65	4.20	4.95	6.05	7.70	10.50			
1½	2.90	3.30	3.85	4.45	5.25	6.35	8.25	10.50	14.00		
1¾	3.05	3.50	4.10	4.70	5.55	6.65	8.80	11.10	14.80	18.00	
2	3.25	3.70	4.35	4.95	5.90	7.05	9.40	11.80	15.70	19.00	22.50
2¼		4.00	4.65	5.25	6.30	7.55	10.10	12.60	16.70	20.20	24.00
2½			5.00	5.60	6.75	8.15	10.90	13.50	17.80	21.50	25.80
2¾				6.00	7.25	8.85	11.80	14.60	19.10	23.10	27.90
3					7.80	9.65	12.80	15.90	20.60	25.00	30.50
Thread to in.	20	18	16	14	12	12	11	10	9	8	7
Add for each ¼ in.	25	35	45	55	65	90	1.20	1.50	1.80	2.30	3.00

Dis., heads ground, 65 and 10%; dis., heads black, 65, 10 and 5%; dis., heads extra finish, 55 and 10%; dis., heads case hardened, 60 and 10%; dis., heads polished-hardened, 50 and 10%.

MILLED HEADS, COLLAR SCREWS
25 and 10% discount.

Diameter of Collar.	¼	11/32	7/16	½	9/16	11/16	13/16	15/16	1	1¼
Diameter of Screw.	⅛	3/16	¼	5/16	⅜	7/16	½	9/16	⅝	¾
¾	2.50	2.80	3.10	3.75	4.40	5.00	6.25			
1	2.80	3.10	3.40	4.05	4.70	5.30	6.60	8.25		
1¼	3.10	3.40	3.70	4.35	5.00	5.60	7.00	8.60	11.25	
1½	3.45	3.70	4 00	4.70	5.30	5.95	7.40	9.00	11.90	15.00
1¾		4.05	4.35	5.05	5.65	6.35	7.80	9.45	12.60	15.60
2			4.70	5.45	6.25	6.85	8.40	10.00	13.35	16.25
2¼				5.95	6.85	7.40	9.00	10.60	14.15	17.10
2½					7.50	8.10	9.60	11.25	15.00	18.00
2¾						8.75	10.30	11.90	15.90	19.00
3							11.00	12.60	16.85	20.00
Threads to inch	40	30	20	18	16	14	12 or 13	12	11	10
Add for each ¼ inch	30	40	50	60	80	1.00	1.30	1.60	2.00	2.40

Length under Head to Point,

MILLED FROM SOLID BAR.

	Fillister.			Bevel Head.				Button Head		
Diam. Head	3-16	¼	⅜	7-16	9-16	⅝	¾	13-16	⅞	1
Length Head	⅛	3-16	¼	5-16	⅜	7-16	½	9-16	⅝	¾
Diam. Screw	⅛	3-16	¼	5-16	⅜	7-16	½	9-16	⅝	¾
¾	2.00	2.25	2.50	3.00	3.50	4.00	5.00			
1	2 25	2.50	2.75	3.25	3.75	4.25	5.30	6.60		
1¼	2.50	2.75	3.00	3.50	4.00	4.50	5.60	6.90	9.00	
1½	2.75	3.00	3.25	3.75	4.25	4.75	5.90	7.20	9.50	12.00
1¾		3.25	3.50	4.00	4.50	5.00	6.20	7.50	10.00	12.50
2			3.75	4.35	5.00	5.50	6.75	8.00	10.75	13.00
2¼				4.75	5.50	6.00	7.25	8.50	11.50	13.75
2½					6.00	6.50	7.75	9.00	12.00	14.50
2¾						7.00	8.25	9.50	12.75	15 25
3							8.75	10.00	13.50	16.00
Threads to inch.	40	30	20	18	16	14	12	12	11	10

Length under Head.

Head on Bevel and Button Head Screws, 1-16 larger in diameter than above specifications.
Price, according to size of head.
Discount, 50and 10%: case hardened, 45 and 10% ; case hardened and polished, 35 and 10%.

Spades and Shovels.

JONES

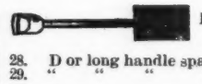
Patent plain black solid cast-steel shovels and spades.

Patent solid steel shovel.

No.		Per Doz. No.	Black.	Per Doz. Pol'd
20.	D. or long handle sq.-point shovels.	2	$15.50	$16.50
21.	" " " " "	3	16.25	17.25
22.	" " " " "	4	17.00	18.50
23.	" " " " "	6	17.50	19.00
24.	" " " " charcoal.	8	20.50	22.00

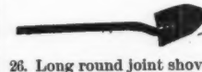
Pt. plain back solid cast steel shovel.

25. D or long handle round-point shovels. 3 16.25 17.25



Patent solid cast steel spade.

28. D or long handle spades.....2 16.00 17.00
29. " " " " 3 16.50 18.00



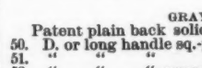
Patent plain back solid cast steel.

26. Long round joint shovel No. 2.....15.50 16.50
27. " square " No. 2.....15.50 16.50
32. D. handle square-point molders' shovels.....2 ..... 17.00
33. D. handle square point railroad, extra heavy.....2 15.75
34. D. handle round point railroad, extra heavy.....3 16.50
35. L. handle round point shovel, with foot cap.....2 16.00 17.00

GRAY'S CAST.

Patent plain back solid-steel shovels and spades.

50. D. or long handle sq.-point shovels. 2 $12.00 $13.00
51. " " " " " 3 12.75 14.00
52. " " " round point " 3 12.75 14.00
55. D. handle spades.....2 12.25 13.25
56. " " " 3 13.00 14.25



Patent solid corrugated cast steel scoop.

SCOOPS.

Jones' patent plain back solid corrugated cast steel scoops.

90. D. or long handle solid cast steel...2 $13.50 $14.50
91. " " " " " ...4 14.50 15.50
91½. " " " " ...6 16.50 17.50

Jones' riveted scoops.

92. Cast steel D. or long handle... ....2 13.50 14.50
93. " " " " 4 14.50 15.50
94. " " " " 6 16.50 17.50
Half polished.
95. " " " 8 $20.00
96. " " " 10 22.50
97. " " " Loco-motive or coal (heavy).....6 17.50
98. " Long or D. handle for salt heavy).....17.50
99. " D. handle flour and house furnace.....10.50
100. " D. handle r'd-pt. for coal (extra heavy).....6 20.00
101. " ash pit, furnace L. handle.....2 Polished, 13.00
102. " " " 32 in. D..2 13.50
103. " " " 42 " iron D. handle.....2 14.00

Ditching spade.

124. D handle ditching (flat).....18.00 19.50
125. D handle post hole (concave).....18.00 19.50
126. D handle Alcock (for clay and brick).....16.00 17.00
Discount on shovels and spades, 50 and 10.
" " scoops, 50.
Boxed f.o.b. New York, Boston or Montreal.
The solid shovels, spades and scoops are made from cast steel bars by a recently patented process, the blade and strap being in one piece, not welded. All goods are American patterns.

Stencil Inks.

Black.

No.	Per can.	Per cake.	No.	Per can.	Per cake.
1.....	7 cents	3 cents	3.....20 cents.		12 cents.
2.....10	"	5 "	4.....30	"	20 "

Blue.

.....10 cents.		6 cents	3.....30 cents.		22 cents
.....15	"	9 "	4.....50	"	40 "

Red and Green.

1.....12 cents		8 cents	3.....50 cents.		42 cents
2.....20	"	15 "	4.....90	"	80 "

Per doz. cans or cakes, net, per gross, 20% less.

Indelible Ink.

Small bottles per	100	$2.75
" "	500	12.00
" "	1,000	20.00

STENCIL COMBINATIONS.

Contains Alphabet, Figures, Brush, and Ink.

½ inch, per doz		$4.80
¾ "	"	5.40
1 "	"	5.40
1¼ "	"	7 50
1½ "	"	8.40
1¾ "	"	10.00
2 "	"	10.00
2½ "	"	15.00

Dis., 20%.

Tools. ARTISANS.

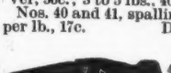
Chisel (Mason).

Stone, 5 and 8c. lb., net.

Mill Picks.
Cast steel, 2 to 3 lb. $22 per doz.
Dis., 60 and 5%.

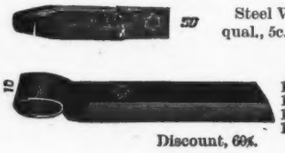
Stone Axes, Cast Steel.
All sizes, 50c. per lb.
Dis., 70 and 10%.

Five lbs. and over, 40c.; with teeth, 45c.; 3 to 5 lbs., 45c.; with teeth, 50c.; under 3 lbs., 50c.; with teeth, 55c.
Nos. 40 and 41, spalling or stone hammer, 5 lbs. and ver, 36c.; 3 to 5 lbs., 40c.; under 3 lbs., 45c. per lb.
Nos. 40 and 41, spalling hammers, 9 to 20 lbs., steel face per lb., 17c. Dis., 70 and 10%



Ship or Top Mauls, Steel Face
4 to 8 lbs., 28c. per lb.
Dis., 50, 10 and 5%..

Steel Wedges, wood, 1st qual., 5c. lb.



Cooper Froes.

8 in..	⅋ doz.	$13.00
10 in..	⅋ doz.	13.50
12 in..	⅋ doz.	14.00
14 in..	⅋ doz.	14.50
16 in..	⅋ doz.	15.00

Discount, 60%.

60 days, 2% 10 days.

Vise.

No 1. Solid Box Vises.

	Each.
No. 25, 3½ in. Jaw	$12.00
" 30, 3½ "	11.00
" 55, 3⅞ "	10.00
" 40, 4 "	10.50
" 45, 4¼ "	11.00
" 50, 4½ "	11.50
" 55, 4½ "	12.00
" 60, 4½ "	13.00
" 65, 4¾ "	14.00
" 70, 5 "	15.00
" 75, 5 "	16.00
" 80, 5¼ "	17.50
" 85, 5¼ "	18.50
" 90, 5½ "	20.00
" 95, 5¾ "	21.00
" 100, 6 "	22.00
" 105, 6 "	23.00
" 110, 6¼ "	24.00
" 115, 6¾ "	25.00
" 120, 6½ "	26.00
" 125, 6½ "	27.50
" 130, 6¾ "	29.00

	Each.
No. 135, 6¾ in. Jaw	$31.50
" 140, 7 "	33.00
" 145, 7 "	35.00
" 150, 7 "	36.00
160, 7¼ "	41.50

	Each.
No. 170, 7¼ in. Jaw	$44.50
" 180, 8 "	47.00
" 190, 8 "	53.00
" 200, 8 "	56.00

Dis., 60 and 10%.

MINERS.

Adze Eye Coal Picks.
Same list and dis. as No. 16.

Anthracite Coal Picks.
Same list and dis. as No. 16.

Stone Picks, per doz.
No. 18, 6 to 7 lbs...$16.50.
No. 18, 7 to 8 lbs... 17.50.
No. 18, 8 to 9 lbs... 18.50.
Dis., 60 and 10%.

No.	Coal Picks.	Per doz.
16, Weight, 2	lbs.	$8.50
16, "	2½ "	9.00
16, "	3 "	9.50
16, "	3½ "	10.00
16, "	4 "	10.50
16, "	4½ "	11.00
16, "	5 "	11.50
16, "	5½ "	12.00
16, "	6 "	12.50
16, "	6½ "	13.00
16, "	7 "	14.00

Packages chiarged at cost. Dis., 60, 10%.

Adze Eye Miners Picks—Surface, Drifting and Poll.

No.			Per doz.
19, Surface.	No. 1, 4 lbs.		$14.00
19, "	No. 2, 4½ "		15.00
19, "	No. 3, 5 "		16.00
19, "	No. 4, 5½ "		17.00
19, "	No. 5, 6 "		18.00
19, "	No. 6, 6½ "		19.00
19, "	No. 7, 7 "		20.00
20, Drifting,	No. 1, 3 "		12.50
20, "	No. 2, 4 "		14.00
20, "	No. 3, 4½ "		15.00
20, "	No. 4, 5 "		16.00
20, "	No. 5, 6 "		17.50
21, Poll,	No. 1, 3½ "		15.00
21, "	No. 2, 4 "		16.00
21, "	No. 3, 4½ "		17.00
21, "	No. 4, 5 "		18.50
21, "	No. 5, 6 "		20.00
21, "	No. 6, 6¾ "		21.50

Dis., 60, 10 and 5%.

Tamping Picks.

Adze eye, 6 to 7 lbs., per doz., $17.
Adze eye, 7 to 8 lbs., per doz., $18.
Adze eye, 8 to 9 lbs., per doz., $19.
Hunt eye, 6 to 7 lbs., per doz. $17.
Hunt eye, 7 to 8 lbs., per doz., $18.
Hunt eye, 8 to 9 lbs., per doz., $19.
Dis., 60, 10 and 5%.

No.	Ore Picks.	
54, Adze Eye,	5 to 6 lbs.	₱ doz. $12.00
54, "	6 to 7 "	" $13.00
54, "	to 8 "	" $14.00

56, Steel Lake Superior Mining Pick

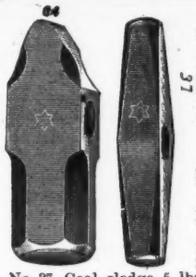
(Special Price and Quality.)

Dis, 60, 10 and 5%.

Steel Face Hammers.

No. 43, hand drilling hammers, 2 to 5 lbs.; No. 45, napping hammers, 2 to 5 lbs.; No. 39, mason hammers, 3 to 8 lbs.; No. 42, smiths' hand hammers, 2 to 5 lbs.; No. 44, smiths' striking hammers, 2 to 5 lbs., all steel face, per lb., 26c. Dis., 70, 10 and 5%.

No. 43, hand drilling hammer, 5 lbs. and over, 36c.; 3 to 4 lbs., 40c.; under 3 lbs., 45c. per lb.
Dis., 70, 10 and 5%.



Steel Face Sledges.
No. 34. Smiths' sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 35. Stone sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 36. Striking sledges, 6 to 30 lbs., steel face, 17c. per lb.
No. 37. Coal sledges, 5 to 10 lbs., steel face, 18c. per lb.

Cast Steel Sledges.
No. 34. Blacksmiths' sledge. 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 35. Stone sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 36. Striking sledge, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 37. Coal sledge, 5 lbs. and over, 30c.; 3 to 5 lbs. 36c.; under 3 lbs., 45c. per lb.

Cast Steel.
No. 42, blacksmiths' hand hammer, 5 lbs. and over 30c.; 3 to 5 lbs., 34c.; under 3 lbs., 45c. per lb.
No. 44, drilling or striking hammer, 5 lbs. and over, 30c.; 3 to 5 lbs., 36c.; under 3 lbs., 45c. per lb.
No. 45, napping hammer, 5 lbs. and over, 30c.; 3 to 5 lbs., 35c., under 3 lbs., 45c. per lb.
Dis., 70 and 10%, 5.

RAILROADS.

Railway Track Punch
Round Point.
15c. lb., net.

Track Wrench.
7¾ lb., net.

Ra Fork.
9c. lb. net.

Crow Bars.
Wedge Points, 3½c. lb., net.
Pinch Point, 3½c. lb., net.

65 Tamping Bar, 6c. lb., net.

66 Claw Bar, 7c. lb., net.

Railroad Spike Mauls
6 to 16 lbs., Steel Face
18c. lb.
Dis., 50, 10, and 5%.

Steel Track Chisel,
15c. per lb., net.

Railroad or Clay Picks.

No.			Per doz.
11, Adze eye,	4 to 5	lbs.	$11.00
11, "	5 to 6	"	12.00
11, "	6 to 7	"	13.00
11, "	7 to 8	"	14.00
11, "	8 to 9	"	16.00
11, "	9 to 10	"	18.00
12, Hunt eye,	4 to 5	"	11.00
12, "	5 to 6	"	12.00
12, "	6 to 7	"	13.00
12, "	7 to 8	"	14.00

Dis., 60, 10 and 5%.

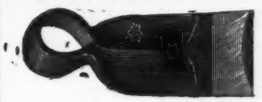
Mattocks—Price per doz.
2, Adze Eye, Long Cutter, 6 lbs., $16.00.
3, Adze Eye, Short Cutter, 5½ lbs., $15.50.
2, Adze Eye, Long Cutter, Light, $15.00.
3, Adze Eye, Short Cutter, Light, $15.00.
4, Hunt Eye, Long Cutter, 6 lbs., $16.00.
5, Hunt Eye, Short Cutter 5½ lbs., $15.50.

Adze Eye Pick Mattocks.....$16.

Hunt Eye Pick Mattocks.....$16

Dis., 60, 10 and 5%

Grub Hoes.
Western Pattern, No. 0, 3 lbs., ₱ doz., $10.50.
Western Pattern, No. 1, 3½ lbs., ₱ doz., $11.
Western Pattern, No. 2, 4 lbs., ₱ doz., $11.50.
Western Pattern, No. 3, 4½ lbs., ₱ doz., $12.
Baltimore Pattern, No. 1, 3½ lbs., ₱ doz., $11.



Baltimore Pattern, No. 2, 4½ lbs., ₱ doz., $11.75
Baltimore Pattern, No. 3, 5 lbs., ₱ doz., $12.75.
Baltimore Pattern, No. 4, 5¾ lbs., ₱ doz., $13.75.
Dis., 60 and 10%, 5.

CARPENTERS'.

BOXWOOD RULES.

Two feet, four-fold, 1 inch wide.

Plate.	Middle.	Edge.	Bound.
Round joint	$4	...	...
Square "	5	$7	$15
Arch "	6	8	16

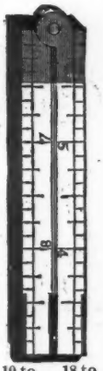
Two feet, four-fold, 1⅛ inches wide.

Plate.	Middle.	Edge.	Bound.
Square joint	$7	$9	$18
Arch "	9	11	20

Two feet, two-fold, 1½ inches wide.

Square joint.	Arch.	Arch Bound.
$5	$7	$16
12	14	24

Gunter's Slide.
Dis. 80, 10 and 10%.



LEVELS.

	10 to 16 in.	18 to 24 in.
Arch top plate, 2 side views	$9.00	$12.00

PLUMBS AND LEVELS.

Arch top plate, 2 side views.

	12 to 18 in.	18 to 24 in.	24 to 30 in.
Polished	$14.00	$16.00	$18.00
Mahogany	....	16.50	22.50
Mahogany tp'd and lp'd	27.00	.....	.....
Polished and l pped	.....	.....	24.00
Polished and tipped	.....	.....	28.00
Polished, lip'd and tip'd	.....	.....	35.00

	in.	
Mason's level, 2 plumbs, polished,	36,	$30.00
Mason's level, 2 plumbs, p'd and t'd,	36,	36.00
Mason's level, 2 plumbs, polished,	42,	36.00

PATENT ADJUSTABLE PLUMBS AND LEVEL.

Arch Top plate, 2 side views 26 to 30 in.	
Polished and lipped	$27.00
Polished and tipped	30.00
Polished, lipped and tipped	39.00
Mahogany	27.00
Mahogany, lipped	33.00
Mahogany, lipped and tipped	48.00
Polished, triple stock, lipped and tipped	48.00
Mahogany " " "	60.00
Rosewood, lipped and tipped	90 00

Dis., 70, 10, 10%

POCKET LEVELS.

Iron top, Japanned	$ 00
Brass top	3.00

Dis., 70, 10, 10%.

SCREWDRIVERS.

Varnished handles, pat. metallic fastening. Size 1½, $1 per dozen; 2, $1.50; 3, $2; 4, $2.50; 5, $3; 6 $3.50; 7, $4; 8, $4.75; 10, $6; 12, $8. Dis., 75 %.

BAILEY'S PATENT WOOD PLANES.

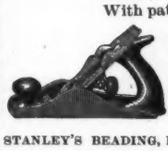
Smooth.	Handle smooth.	
9 × 8¾ in.	8 × 2 in.	9 × 2 in.
$2	$2	$2.50 each

Jack.	Fore.	Jointer.
15 × 2⅜ in.	20 × 2⅜ in.	26 × 2⅜ in.
$2.50	$2.75.	$3.25 each

Dis., 40, 10 and 10%.

PLANES, BAILEY'S PATENT IRON.

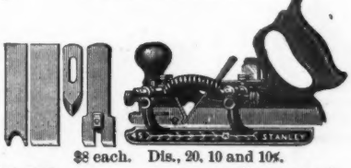
With pat. lateral adjustment.



Smooth, 8 n. × 1¾ in., $3; in. × 2 in., $3.25; 10 in. × 2⅜ in., $3.75 each.
Jack, 14 in. × 2 in., $3.75.
Fore, 18 in. × 2⅜ in., $4.75
Jointer, 24 n. × 2⅜ in., $6.50 each.
Dis., 40, 10 and 10 %.

STANLEY'S BEADING, RABBET, SLITTING AND MATCHING PLANE.

Eighteen Tools, Bits, etc.



$8 each. Dis., 20, 10 and 10%.

STANLEY "ODD JOBS."

Embraces in combination with ordinary Carpenters' Rule:

(1) Try square.
(2) Mitre square.
(3) T——— square.
(4) Marking gauge.
(5) Mortise gauge.
(6) Depth gauge.
(7) Mitre level.
(8) Spirit level and plumb.
(9) Beam compass.
(10) Inside square for making boxes and frames.

Price 75 cents.
Dis., 20, 10 and 10%.

STANLEY IRON BLOCK PLANES.

3⅛ × 1 in. 20c.

5⅛ × 1¼ 40c.

7½ × 1¾ in. 60c. each.

ADJUSTABLE.

5½ × 1¼ in. 60c.

7½ × 1¾ in. 85c. each.

Dis., 40, 10 and 10%

Double Gate Brass Valves.
Gland in packing box.

Size.	Screw socket.	Flange.	Diameter of Standard Flange.	Face to face of Screw socket	Face to face of Flanges.	Extra for slide stem and lever subject to discount.
In.	$	$	In.	In.	In.	
⅛	1.25	.....	.....	2¼	.....	$1.00
¾	1.65	.....	.....	2½	.....	1.00
1	2.15	.....	.....	2⅝	.....	1.00
1¼	3.15	.....	.....	3⅜	.....	1.00
1½	4.25	.....	.....	3¾	.....	1.00
2	6.25	11.50	6	4⅛	4⅝	1.00
2½	11.50	18.00	6½	4 13-16	5⅜	1.25
3	16.00	22.00	7	5	6¼	1.25
3½	21.00	31.00	7½	.....	.....	1.25
4	35.00	43.00	9	.....	7 1-16	1.25
5	52.00	64.00	10	.....	.....	1.25
6	78.00	90.00	11	.....	9	1.25
8	.....	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	.....	.....
12	.....	.....	.....	.....	.....	.....

Rubber-Faced Slide Gate Fire Hydrant.

Diameter of pipe connection.	Diameter of stand pipe.	Diameter of seat ring.	One 2½ nozzle.	Two 2½ nozzles.	Three 2½ nozzles.
Inches.	Inches.	Inches.			
3 or 4	4½	3	$28		
3-4-6	5¾	4	31	$33.00	$35.00
4 or 6	7	5	.....	38.50	40.50
6 or 8	8	6	.....	49.00	51.00
8 or 10	10	8	.....	.....	.....

Four 2½ nozzles.	Six 2½ nozzles.	One steamer nozzle.	One steamer and one 2½ nozzle.	One steamer and two 2½ nozzles.	Frost case, standard length.
.....	.....	.....	.....	.....	$4.50
.....	.....	$33.00	$35.00	$37.00	5.00
.....	.....	38.50	40 50	42.50	6.50
$53.00	.....	49.00	51.00	53.00	7.50
.....	.....	.....	.....	.....	.....

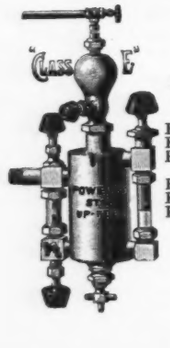
For each 6 inches more or less than standard length of stand pipe, add or deduct from list.	For each 6 inches more or less than standard length of frost case, add or deduct from list.	Extra charge for hub.	Independ't nozzle gates each.
$0.60	$0.44	.....	.....
.75	.50	6 in. $0.50	$3.50
.85	.70	No ch'ge	3.75
1.00	.90	8 in. $1.25	3.75
.....	.....	.....	4.50

Star Globe, Angle and Check Valves.

Size, inches.	⅛	¼	⅜	½
Globe and angle	.80	.85	.90	1.20
Check V	.70	.70	.75	.95
Size	¾	1	1¼	1½
Globe and angle	1.55	2.00	3 00	4.00
Check V	1.20	1.65	2.50	3.25
Size	2	2½	3	
Globe and angle	6.50	12 50	19.00	
Check V	5.00	11.00	15.00	

Dis., 50%.

Also made heavy and extra heavy for special uses.



Star Sight Up-feed Lubricators.
Class E.

Size.	⅛ ft.	¼ ft.	1 ft.
Bronzed	13.00	15.00	20.00
Finished	15.00	17.00	22.00
Plated	17.00	19.00	25.00
		1 qt.	½ gal.
Bronzed		25.00	34.00
Finished		28.00	38.50
Plated		32.00	43.00

Less 75% discount.

Signal Sight Feed Oiler.

Numbers	0	1	1½	2
Diameter of glass, inches	1¼	1½	1¾	2
Height of glass, inches	1⅛	1⅝	1⅝	1⅞
Capacity	½ oz.	¾ oz.	1 oz.	2 oz.
Size of shank, pipe thread, inches	¼	¼	⅜	⅜
Signal Sight Feed Oiler, each	$3.00	$3.25	$3.50	$3.75
Signal Sight Feed Oiler, nickel plated, each	3.50	3.75	4.00	4.25
Numbers	3	4	5	6
Diameter of glass, inches	2¼	2½	3	3½
Height of glass, inches	2⅛	2¼	2¾	4
Capacity	¼ pt.	⅓ pt.	½ pt.	1 pt.
Size of shank, pipe thread, inches	⅜	½	½	½
Signal Sight Feed Oiler, each	$4.25	$5.25	$7.25	$9.25
Signal Sight Feed Oiler, nickel plated, each	4.75	5.75	8.00	10.25

Less 65% dis.

EDDY VALVES.

Class 1. Class 2. Class 3 and 4.

Class 1. Brass valves, steam metal. Size in inches.	Screw ends.	Flange ends.	Class 2. Iron, brass mounted. Size.	Screw, or flange ends.	Add for S S&L	Class 3. All ir'n for gas. Hub ends.	Class 4. Water works valves. Hub ends.
⅛	$1.30	.....	⅛	$7.00	$1.00	$8.00	$10.00
¾	1.70	.....	2½	10.50	1.30	.....	.....
1	2.20	.....	3	13.00	1.40	10.00	15.00
1¼	3.20	.....	3½	16.50	1.50	.....	.....
1½	4.20	$7.50	4	18.00	1.70	15.00	18.00
2	6.20	9.00	4½	22.00	1.80	.....	.....
2½	11.50	15.00	5	25.00	2.00	20.00	25.00
3	16.00	20.00	6	31.00	2.30	25.00	31.00
3½	22.00	28.00	7	37.00	2.70	30.00	37.00
4	35.00	42.00	8	45.00	3.00	35.00	45.00
5	50.00	60.00	10	60.00	3.50	48 00	60.00
6	80.00	90.00	12	80.00	4.00	65.00	80.00
8	130.00	130 00					

All Iron Valves, Class 2. 10 per cent. less than Brass Mounted

Varnish.

E.S. 1827 &Co.

For Finishing Coats.	gal.
Wearing body varnish	$5.50
Medium drying body	5.50
One coat coach varnish	4.50
Wearing carriage	4.50
Heavy gear varnish	4.00
Coach body "	4.00
No. 1 coach "	2.25

For Under Coats.			
Hard drying body	$4.50	Black rubbing varnish	$4.00
Rubbing body varnish	4.00	Priming (1st coat)	2.50
Quick rubbing "	3.50	Filling (2d coat)	2.50
		Rough stuff	2.50

For Inside Work.			
Best flowing varnish	$4.50	Hard oil finish light	$2.75
Best polishing "	4.50	" dark	2.25
Cabinet "	3.00	White copal	4.00

Dryers.			
Japan gold size	$3.50	Brown japan	$1.25
Coach japan	1.75	Liquid dryer	1.25

Discount, 40 per cent. f.o.b. N. Y.

Preservative Coatings.			
Spar coatings	$4.00	Exterior car coating	$4.00
I. X. L. No. 1	2.50	Interior car coating	3.25
I. X. L. No. 2	4.00	Locomotive coating	4.00
Floor finish	2.50		

Discount, 35 per cent, f.o.b. N. Y.

Wheelbarrows.

Climax Bolted Barrow, with Wood Wheel per doz. $22.50.
1½ tire of iron,
Common Nailed Barrow per doz. $18.50.
" Bolted " " " 18.75.

Lansing's Patent Iron-Bolted Barrow, per doz.,			$25.50
Capital Patent Bolted Dirt	"	"	30.00
Red oak or Government	"	"	40.50
Wharf	"	"	72.50
Mortar	"	"	30.00
Bent Handle Stone	"	"	48.00
Coal or Ore	"	"	31.50
Pig Metal or Casting	"	"	40.50
Brick Yard 20 inch Iron Wheel	"	"	10.50

Globe Patent Bolted Garden Barrow, Box 30 by 24 by 12 deep, wood wheel } per doz., 42.50.

Capita Patent Barrows

With Iron Tray, A, per doz.,		$39.00
" " " B, " "		42.00

The Leader Iron and Steel Barrows.
Gas-pipe Legs and Handles in one price.

No. 1 Tray of 16 iron, capacity 3 cu. ft. of earth, each		$12.
No. 2 " " 14 " " 5 " " "		
or 250 lbs. of coal	"	15
Galvanized 18 iron, capacity same as No. 2	"	15

Water Wheels. Pelton.

	Under pressure of 30 Lbs.	60 Lbs.	100 Lbs.
No. 1, $25	½ H. P.	1 H. P.	2 1-10 H. P
No. 2, $50	¾ "	2½ "	5 "
No. 3, $100	1½ "	4 "	8½ "
No. 4, $150	2½ "	7 "	14¾ "
No. 5, $200	4½ "	12½ "	26 "

Dis. 20%.

Whiffletree.

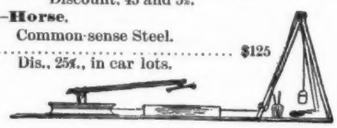
Willson spring Jeffery Manufacturing Company.

	Single.	Double.
No. 1, 34 or 36 inches long	$1.25	$2.50
No. 2, " " "	1.40	2.75
No. 3, " " "	1.50	3.00
No. 4, " " "	1.65	3.25

Including either steel hooks or rings
Discount, 45 and 5%.

Whims—Horse.

Common-sense Steel.
F. O. B $125
Dis., 25%., in car lots.



Windmills.

10 ft., pumping	$75	
12 ft. "	95	Plus cost of packing.
14 ft. "	140	
16 ft. "	225	

Dis., 50 per cent.
Delivered on board of vessel at New York packed for export.
Dis., 45%.

"Stover" Pumping Windmills (no tower).

Size wheel.	Wt. packed.	Cubic ft.	Price.
10 ft.	650	50	$80.00
12 ft.	750	58	100.00
"Zenith" Pumping Windmills (no tower).			
10 ft.	650	48	85.00
12 ft.	750	57	110.00
Dis., 50 per cent.			
14 ft.	1,400	108	160.00
16 ft.	1,600	114	250.00
Dis., 45 per cent.			
20 ft.	2,950	220	400.00
25 ft.	4,225	280	600.00
Dis., 40 per cent.			

"Zenith" Geared Windmill (no tower).
Prices include upper set of Gears and about 5 feet vertical extra heavy shaft in windmill head.

14 ft.	1,550	178	260.00
16 ft.	1,780	198	300.00
20 ft.	3,170	216	500.00

Dis., 40 per cent.

Wire Rope.

Circumference in inches.	Diameter in inches.	Price in cents per foot best crucible cast steel rope. 19 wires to strand.	7 wires to strand.	Price in cents per foot best bright iron rope. 19 wires to strand.	7 wires to strand.	Price in cents per pound galvanized iron rope. 12 wires to strand.	7 wires to strand.
5½	1¾	100	.....	69	.....	11	10½
5¼	...	90	.....	64	.....	"	"
5	1⅝	80	.....	58	.....	11½	"
4¾	1½	71	.....	53	.....	"	"
4½	...	65	.....	48	.....	"	"
4¼	1⅜	60	60	43	39	"	"
4	1¼	50	50	36	34	"	"
3¾	...	46	.....	33	.....	"	"
3½	1⅛	41	40	29	27	12	10¾
3¼	...	.....	.....	.....	.....	"	11
3⅛	1	34	32	26	23	.....	.....
3	...	33	.....	24	.....	"	11
2¾	⅞	27	25	20	19	.....	12
2½	...	23	.....	18	.....	.....	13
2¼	¾	21	19	16	14	.....	14
2	⅝	18	14	14	10½	.....	15
1¾	9-16	17	11	12	8	.....	16
1½	½	15	8	10	7	.....	16
1¼	⅜	.....		8	5	.....	17
1	5-16	.....		.....	4	.....	18

Discounts, for export in bond, requiring from four to six weeks time, 55%.